

Journal

OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION

Drug Combinations for Parasites of Cattle

A REPORT on treatment of internal parasite infections of cattle with phenothiazine, piperazine citrate, and hexachloroethane.

Page 1

African Horse-Sickness

A REVIEW of the clinical signs of this highly fatal disease which has spread from Africa to some of the Mediterranean countries.

Page 15

Survey of Leptospira Antibodies in Dogs

RESULTS of a survey of the incidence of canine leptospiral antibodies in Syracuse, N.Y.

Page 25

Neoplasms of Dogs

A TABULATION is presented of 145 neoplasms found in 127 privately owned dogs examined routinely from 1956 through 1959.

Page 27





Safety and
rapid response
assured with

TEMPACINE

CANINE DISTEMPER VACCINE, TISSUE CULTURE ORIGIN, MODIFIED LIVE VIRUS



TEMPACINE Canine Distemper Vaccine stimulates immunity so rapidly that vaccinates can withstand severe challenge in one to three days. TEMPACINE is safe. None of the vaccinates used in CS tests showed signs of disease or severe reaction. None of the susceptible dogs or ferrets kept in plain contact with vaccinates became diseased or

acquired immunity. Dogs vaccinated by practitioners in trials throughout the U.S. developed titers indicating solid immunity as measured by the Cornell canine serological standards.

TEMPACINE, a tissue culture, modified vaccine made from the most antigenic virus strain available, is desiccated for stability. It is now stocked in plastic cartons of 5 single-dose vials (2 cc. each) with diluent at all CS distribution points.



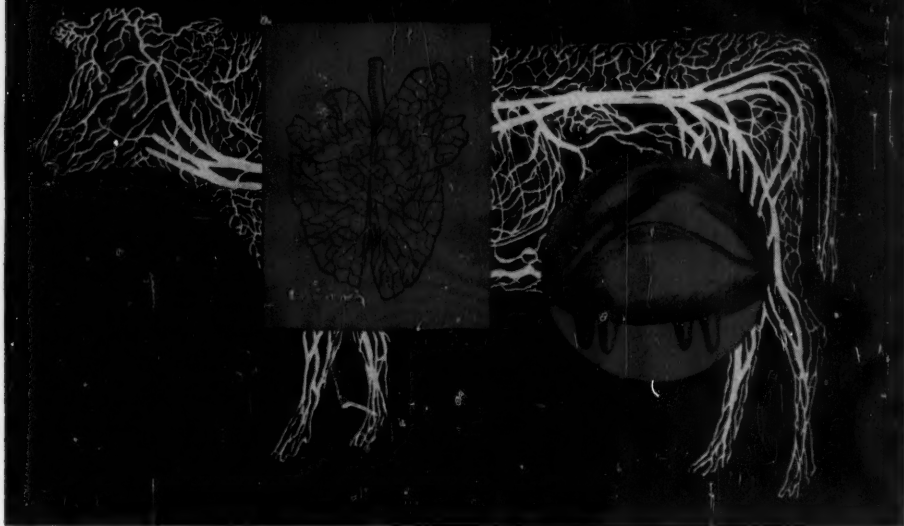
CORN STATES LABORATORIES, INC.

1124 HARNEY STREET • OMAHA, NEBRASKA

SUBSIDIARY OF ELI LILLY AND COMPANY



**The "affinity" antibiotic for
respiratory and mammary infections**



IOMYCIN[®] FOR ALL SPECIES

DiethylaminoethylesterpenicillinGhydriodide—dihydrostreptomycin

Livestock and small animal patients alike benefit from the effectiveness of IOMYCIN, the antibiotic especially for the treatment of respiratory and mammary infections. IOMYCIN combats infections of alveolar tissues—directly and safely.

IOMYCIN's effectiveness is derived from *diethylaminoethylesterpenicillinGhydriodide*, the antibiotic with specific affinity for respiratory and mammary tissues—providing up to 5 times more tissue concentration than does procaine penicillin G. High concentration means favorable response against disease conditions that often fail to respond to standard antibiotics.

IOMYCIN also offers *dihydrostreptomycin*, resulting in a combination of antibiotics that provides broad spectrum activity to combat gram negative-positive organisms commonly associated with respiratory and mammary infections.

Supplied in small animal, regular, and bulk sizes.



NORDEN LABORATORIES, INC.

LINCOLN, NEBRASKA

CONTENTS

LARGE ANIMAL ARTICLES

Combination Drug Treatment for Internal Parasite Infections of Cattle— Leonard E. Swanson and A. E. Wade	1
Report of Glossitis in Feedlot Cattle—William L. Wake	7
Mycotic Dermatitis in a Steer—Loren D. Kintner and Donald C. Blendon	9
Distal Epiphyseal Fracture of the Femur in a Shetland Pony—G. D. Pettit and J. D. Wheat	13
African Horse-Sickness—Council on Public Health and Regulatory Veter- inary Medicine	15
Survey of Nebraska Veterinarians on Mastitis and the Antibiotic Problem— Harold R. Irvin	17
Colostomy for Repair of Atresia of Anus and Rectum in a Pig—Leslie Dozza and N. O. Olson	20

SMALL ANIMAL ARTICLES

Pathology and Surgic Correction of Perianal Fistulous Tracts in a Dog— Albert Schaffer and Irving R. Block	22
A Serological Survey of Leptospira Antibodies in an Urban Canine Popu- lation—E. M. Kravis and Daniel Ivler	24
Neoplasms of Dogs—J. P. Thrasher	27

GENERAL ARTICLE

Portosystemic Communications in Animals with Hepatic Cirrhosis and Malignant Lymphoma—Arturs Vitums	31
--	----

EDITORIAL

Why We Have Extension Veterinarians	35
---	----

FEATURES

Correspondence	adv. p. 4
Washington News	adv. p. 14
What Is Your Diagnosis?	adv. p. 27
History of the AVMA	adv. p. 37
Quiz for Quidnuncs	adv. p. 40

Contents continued on adv. page 4

EDITORIAL STAFF: D. A. Price, *Editor in Chief*; A. Freeman, *Assistant Editor*; H. E. Kingman, Jr., *Managing Editor*; R. G. Rongren, *Advertising Manager*; Eva G. Bailey, *Production Manager and Assistant to the Editors*.

AVMA OFFICERS: E. E. Leasure, Manhattan, Kan., *President*; C. M. Rodgers, Blandinsville, Ill., *Vice-President*; M. L. Morris, Allenspark, Colo., *President-Elect*; H. E. Kingman, Jr., Chicago, *Executive Secretary and Treasurer*; J. O. Knowles, Miami, Fla., *Chairman of the Executive Board*.

\$15.00 per Annum

Single Copies, \$.75 Prepaid in U.S.

Canada, \$15.50; Pan American Countries, \$16.50; Foreign, \$17.00

Published semimonthly at 600 S. Michigan Ave., Chicago 5, Ill., by the American Veterinary Medical Association. Second class postage paid at Chicago, Ill., and at additional mailing offices. Contents copyright 1961 by the American Veterinary Medical Association.

CHANGE OF ADDRESS: Send new address (and moving date) 45 days before moving. Include old address as it appeared on previous issues (if possible send label). Do not depend on the post office to forward the JOURNAL.

NOW, AN ANTIBACTERIAL
WITH DISTINCTIVE BENEFITS
IN VETERINARY MEDICINE

bactrovet^{*}

(Brand of Sulfadimethoxine)

... COMBATS BOTH GRAM-POSITIVE AND GRAM-NEGATIVE BACTERIA

IS EXCEPTIONALLY SAFE THERAPY

IS AN IDEAL AGENT FOR DISPENSING

IS CLINICALLY EFFECTIVE IN ONCE-A-DAY DOSAGE FOR

pneumonia
enteritis
pharyngitis

otitis
bronchitis
cystitis

prostatitis
mastitis
metritis

cellulitis
abscesses
wound infections



PITMAN-MOORE COMPANY DIV. OF ALLIED LABORATORIES, INC., INDIANAPOLIS 6, IND.

Ask your Pitman-Moore Company
representative for clinical literature or
write the Professional Service Department



*Pitman-Moore Company's trademark for 2,4-dimethoxy-6-sulianilamido-1,3-diazine

Correspondence

Dogs with Ragweed Allergy Needed

Nov. 18, 1960

Dear Sir:

The investigation of ragweed allergy in a dog (*J.A.V.M.A.*, Aug. 1, 1959: 178-180) has resulted in some advances in basic knowledge of ragweed hypersensitivity. Investigation of the dog described in the article is now being continued at Northwestern University Medical School; her hypersensitivity has persisted unchanged over the two years she has been studied.

Future investigation of similar dogs would be of great benefit to basic knowledge in studies of immediate hypersensitivity and of benefit to both dogs and man. We are limited because of the lack of other dogs for investigation. While the problem of ragweed allergy in dogs is not rare (I have heard of other dogs with similar signs) I have been unable to obtain other dogs with ragweed allergy.

We urgently need dogs with nasal or chest signs during the ragweed season, August 15 to October 1, and would like to hear from practicing veterinarians who may know of such a dog which would be available for investigation.

S/ROY PATTERSON, M.D.
Allergy Res. Lab.,
Northwestern University Medical School
Chicago 11, Ill.

Correction—Nov. 15 Editorial

Nov. 30, 1960

Dear Sir:

I have just noticed an error, which I think should be corrected, in the editorial of our JOURNAL, November 15.

In "Table 1—World's Leading Countries in Veterinary Population," you did not mention Canada. Our country has more than 2,200 veterinarians, according to the "Annuaire du Canada, 1958."

S/BERNARD LAROLCHE, Veterinary Student
2465 Bachand St.
Saint-Hyacinthe, Quebec, Canada

[Ed. Note: Canada's omission was an oversight. It should have been listed twelfth, after Brazil.]

PORTABLE DOG PENS



LOW PRICES!

Sectional design, permanent or portable. Strong, rugged. Long life. Welded galvanized pipe frame. Chain link fence. Discourages climbing. Improves ventilation, cleanliness. Less disease. Designed and built for your purpose. Send sketch and size. Freight paid. Write for circular and prices.

Brinkman Mfg. Co., Dept. 50, Huntoon & Auburn Rd., Topeka, Kansas

ABSTRACTS

Prolapsed Bladder Resembles Tumor . .	6
Cysteamine Therapy for Bovine Ketosis .	6
Brucellosis Spread by Rabbits	8
African Ticks Found at 2 U. S. Locations	12
Foot-and-Mouth Disease Virus Proves Highly Stable	12
Digitalis Increases Serum Potassium Levels	14
Quarantine Against African Horse-Sickness	16
Veterinary Antibiotic Use Increases . .	19
Malathion for Mange in Cats	26
Antiestrus Drug	26
Screwworms Discovered on Racing Dog in Florida	30
Pentobarbital Safe for Bird Anesthesia	34
World Shortage of Veterinarians . . .	36
Antibiotic Contamination of Milk Reaches Lowest Incidence	36

from the RESEARCH JOURNAL

Tests for Tuberculosis in Cattle	37
Neurotropism of Equine Influenza-Abortion Virus	37
Protein Nature of Negri Bodies	37
Bactericidal Properties in Rabbit Uteri .	38
Propagation of Hog Cholera Virus . . .	38
Induced Leukopenia in Rabbits	38
Inflammatory Uterine Exudates in Rabbits	39
Histopathology of FMD in Mice	39
Dictyocaulus viviparus in Laboratory Animals	39

NEW BOOKS

A Laboratory Guide in Virology	40
Principles of Veterinary Pathology . . .	40

NEWS

AVMA Executive Board District I Meets New England V.M.A. Meeting Follows District I Sessions	42
AVMA Executive Board District III Meets Southern V.M.A. Meeting Follows District III Sessions	42
Animal Care Panel Meets	43
Museum to Display Veterinary Office of Yesteryear	44
Milk Sanitarians Hold Mastitis Conference	45
American Association of Avian Pathologists Meets	46
Course in Veterinary Mycology Offered Dr. C. W. Wilder Made Assistant Chief Staff Officer	47
Dr. P. H. Kramer to Assist at Springfield, Ill.	47
Dr. O. W. Seher Retires	48
Dr. L. J. Rafoth Replaces Dr. Seher . . .	48
Dr. B. M. Cox Sent to East Africa	49
Veterinarians Awarded Advanced Degrees	49
Among the States and Provinces	53
Veterinary Military Service	56
State Board Examinations	57
Deaths	57
Women's Auxiliary	58

BREAK THROUGH THE EARWAX BARRIER WITH **SEBUMSOL™**

(hexamethyltetracosane, 'PARLAM')



**CLEANS
EARS
SAFELY
... MORE
EFFECTIVELY**

□□□ **ideal new
cerumenolytic
agent**

□□□ **without anesthetics
or instruments**

INDICATIONS:

- (1) Removes excess or impacted earwax.
- (2) As a pre-treatment. Removes "cerumen barrier." Enhances effectiveness of any additional therapeutic measures.
- (3) Cleans the ears; facilitates aural examination and diagnosis.
- (4) Relieves otitis externa, itching and pain, due to excessive cerumen.

SUPPLY: 'SEBUMSOL' is available in 1 fl. oz. dropper bottles with dispensing label; also pint bottles for hospital use. Low priced for routine use.

Only 1 dropperful of a safe, new drug now offers greater success in ear diagnosis and therapy. Called 'SEBUMSOL', it provides deep penetration of waxy deposits and thoroughly cleans the ear canal without irritation.

'SEBUMSOL' cleans better because it mixes so freely with sebaceous and cerumenous secretions. Loosens and dissolves hard, deep-seated wax and fatty deposits; floats them to the surface where they can be quickly and easily wiped away.

Traditional cleansing agents employ foreign materials that attempt to perform by chemical or mechanical action. 'SEBUMSOL' relies entirely on its natural physical action for its therapeutic activity.

In recent controlled tests on 550 dogs and cats, 95% good to excellent results were obtained with easy to use 'SEBUMSOL.'

Non-irritating, non-allergenic, non-anaphylactic. No residue. No hair discoloration. Completely safe.

'SEBUMSOL' complements . . . does not complicate any additional therapy which may be required.



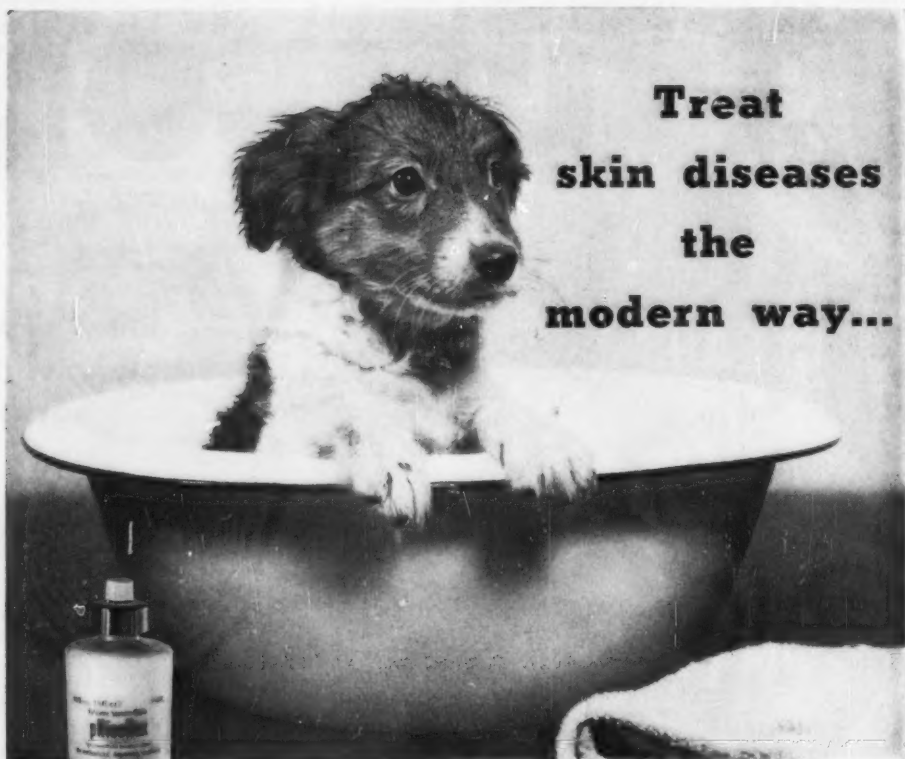
Parlam
CORPORATION

Write for samples and literature.

266 South Dean Street • Englewood, New Jersey

CANADA: Veterinary Medical Supply Co. of Canada, 4700 Prince of Wales, Montreal

"Pioneer in veterinary medicine for target point chemotherapy"



**Treat
skin diseases
the
modern way...**



WITH

pHisoHex[®]

ANTISEPTIC DETERGENT

In the treatment of nonspecific and bacterial dermatoses and even parasitic diseases, it is important that the cat or dog be bathed with a gentle nonirritating antiseptic detergent. In addition to its safe, gentle and effective detergency, pHisoHex leaves a residual bacteriostatic film on the skin.

PRICES ON REQUEST

pHisoHex, trademark reg. U.S. Pat. Off.

Winthrop **LABORATORIES**
NEW YORK 18, N. Y.

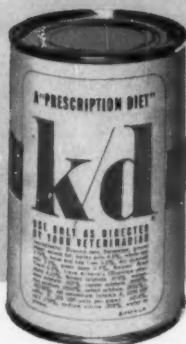
■
dietary food
for
mature dogs
for use in the
clinical management
of

cardiac patients

A "PRESCRIPTION DIET"
®

SOLD ONLY TO
GRADUATE
VETERINARIANS

*You can't beat
good food
for good health*



PROFESSIONAL PRODUCTS DIVISION

HILL PACKING COMPANY, TOPEKA, KANS.

HIGHEST ELEMENTAL IRON CONTENT
of any complex injectable iron product produced!

PIG ANEMIA PREVENTION?

... You need only a

1cc DOSE with..

Rapid, Greater Weight Gains

1cc DOSE IS EFFECTIVE

It was established through extensive testing that 1cc of FERAJECT 110, effectively afforded greater weight gains and higher hemoglobin values than non-treated pigs. It was further established that there was not a significant difference in weight gains produced by twice the level of the 110 mgs. of elemental iron in a 1cc dose of FERAJECT 110.

FORMULA and PACKAGING

EACH 1cc CONTAINS THE EQUIVALENT OF 110 mg. ELEMENTAL IRON AS AN AMYLOSE-IRON COMPLEX with Vitamin B₁₂ activity 2 mgs. Cobalt (as chloride) 5 mgs. Zinc 0.5 mg. (as the sulfate). Pyridoxine Hydrochloride (Vitamin B₆) 1 mg. and Coll. Calcium Phosphate** in isotonic solution, preserved with Phenol 0.5%.

Feraject 110 is available in 30 dose and 100 dose vials in attractive styrofoam displays of one dozen.

DIAMOND LABORATORIES
DES MOINES, IOWA



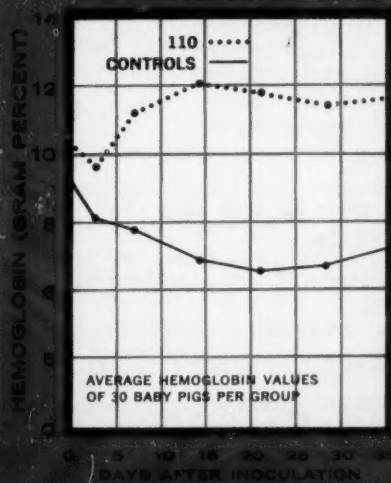
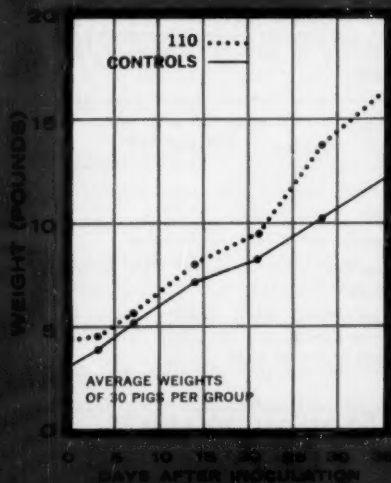
..feraject

amylose complex
injectable iron

110

Higher Hemoglobin Values

TEST RESULTS OF FERAJECT 110



first in progress...through research

AMERICAN VETERINARY SUPPLY COMPANY, INC. • CHICAGO, ILL. • U.S.A.

How to Acquire a Permanent Savings Habit in Minutes

Learning to save isn't the easiest thing in the world. But thousands of Americans have discovered a way that requires no learning—buying U.S. Bonds on Payroll Savings. Just ask your company's bond officer to set aside any amount you wish each payday. You'll be surprised how little it changes your spending habits—and how quickly your savings will grow. Try it and see!

U. S. SAVINGS BONDS ARE MORE THAN A GOOD WAY TO SAVE

You save automatically with the Payroll Savings Plan.

You now get $3\frac{3}{4}\%$ interest at maturity.

You invest without risk under a U. S.



Just sign your name and you're saving! Buying U. S. Bonds on payroll savings requires no "saving skill". Your payroll clerk does the saving for you.

NOW every Savings Bond you own—old or new—earns $\frac{1}{2}\%$ more than ever before.

Government guarantee.

Your money can't be lost or stolen.

You can get your money, with interest, anytime you want it.

You save more than money—you help your Government pay for peace. Buy Bonds where you work or bank.

You Save More Than Money With U.S. Savings Bonds

The U. S. Government does not pay for this advertising. The Treasury Department thanks The Advertising Council and this magazine for their patriotic donation.



New Lower Price plus New 25-Capsule Bottle



BYOGIC[®] for the Treatment and Management of the Respiratory-Enteritis Complex and Sequelae

(ANTIBACTERIAL—ANTICHOLINERGIC)

Byogic is a combination of two specific agents, Erythrocin[®] and Tral[®] for the treatment of upper respiratory infections and enteric disturbances in small pet animals and laboratory colonies.

Ingredients of Proven Safety and Effectiveness

Each Byogic capsule contains 100 mg. Erythrocin, an antibiotic of demonstrated safety and one that is quite often effective against "resistant" organisms.

Each capsule also contains 20 mg. of Tral, our highly specific anticholinergic that acts directly on the gastro-intestinal tract to reduce secretion of digestive juices and the motility of the stomach and intestines.

Especially Valuable in Treatment of Puppies and Old or Debilitated Animals

Gastro-intestinal involvement often accompanies infectious conditions in young, old, or weak animals. The antibacterial-anticholinergic action of Byogic makes it possible to treat complicated conditions in these animals quickly, safely, and inexpensively. **Complete literature and clinical data is yours for the asking, doctor.**



BYOGIC—ERYTHROCIN WITH TRAL ERYTHROCIN—ERYTHROMYCIN STEARATE, ABBOTT TRAL—HEXOXYLUM METHYLSULFATE, ABBOTT 012253

New Broad-spectrum water treatment in easy-to-use dispensing pack

Each packet is premeasured to supply prescribed medication levels up to 100 gallons of water

Formulated with 10 grams oxytetracycline HCl per pack . . . plus 8 important vitamins

Available with convenient tear-off dispensing label

When water treatment is indicated, dispense Cosa-Terramycin Fortified Soluble Powder.

It supplies broad-spectrum effectiveness against diseases caused by gram-negative and gram-positive bacteria, as well as rickettsiae, spirochetes and certain large viruses.

And it is formulated with high levels of 8 important vitamins to help insure adequate vitamin intake during periods of increased stress when:

Animals may be too sick to eat, but are still drinking; the metabolic rate is increased due to infection and fever; diarrhea and vomiting may have reduced nutrient absorption; and when tissue repair calls for increased nutrient supplies.



Convenient oral treatment—sick animals often continue to drink. Cosa-Terramycin's antibiotic-vitamin formula gives two-way treatment to help speed recovery.

Prescribe it for:

Prevention—During critical periods from birth to weaning, dispense Cosa-Terramycin where indicated for prevention of scours and other

oxytetracycline-susceptible disease conditions of pigs, calves or lambs. Prescribe it for use at times of stress in older animals to help prevent setbacks from disease attacks by organisms susceptible to oxytetracycline.

Treatment—When oral broad-spectrum antibiotic therapy is indicated, consider Cosa-Terramycin for effective treatment through the drinking water without change in feeding or other management practices.

Follow-up Therapy. In conjunction with Liquamycin® Injectable, Cosa-Terramycin can be used to continue oxytetracycline therapy after completion of the recommended injection treatment course.



The new 24.8-lb. dispensing pack contains 62 individual 6.4-oz. packets. Each pack treats 25 to 100 gallons of water, depending on treatment level needed. Also available in ¼- and ½-lb. bottles and 5-lb. canister.

Department of
Veterinary Medicine
Chas. Pfizer & Co., Inc., New York, N. Y.
Science for the world's well-being™

Sold only to veterinarians

COSA-[®] Pfizer
TERRAMYCIN[®]
BRAND OF OXYTETRACYCLINE HCl

Fortified Soluble Powder



FROM THE AVMA WASHINGTON OFFICE
J. A. McCallum, VMD
Brig. Gen. USA (Ret.)

**Additions to List of
Newly-Elected Representatives**

As a result of final tabulation of the election count, the following additions should be made on the list of newly-elected members to the 87th Congress, which appeared in JOURNAL Dec. 15, 1960, adv. p. 14: *Connecticut*—Abner W. Sibal (R. 4th); *Kansas*—Robert F. Ellsworth (R. 2nd); *Vermont*—Robert T. Stafford (R. Al.).

**USDA Poultry and Livestock
Meeting Dates Set**

Among the USDA Research Advisory Committee meetings scheduled for 1961 are *Poultry*, January 16-19, and *Livestock*, February 14-17, both in Washington, D.C.

**Educational, Health Agencies
Receive HEW Funds**

Dept. HEW distributed more than \$90,500,000 in federal surplus property among states and possessions during third calendar quarter of 1960. The recipients were educational institutions, public health agencies and civil defense units, and nonprofit private health and educational institutions exempt from federal taxes.

**NIH Grants Funds for
Biochemistry Research**

Division of General Medical Science, National Institutes of Health, recently announced the award of \$781,169 for support of basic research in biochemistry. This is close to a \$6,000,000 total of current allocations awarded by N.I.H. for investigation in the chemistry of life processes.

**Article on Grant Applications
Available**

"Why are Research Grant Applications Disapproved?" is the title of an article by Dr. Ernest M. Allen, Chief of the Division of Research Grants, National Institutes of Health, which appeared in A.A.A.S. publication, *Science*, Nov. 25, 1960, Vol. 132. The characteristic shortcomings of rejected applications are described.

(Continued on adv. p. 16)



"Take my practice, for instance—everybody does..."

"Just the other day, I met Joe Temmerin downtown. We talked about the weather and the price of corn, but we never did get around to hogs, though I hinted at the subject.

"Now, that's unusual, because we worked together for many years, building his operation into one of the most profitable in this part of the state.

"Until a few months ago, that is. Then, Joe, like several other fellows I know, decided to go it alone. After all, couldn't he get all the supplies he wanted? Who needs

a veterinarian? So, he took the amateur route, and there went a part of my practice.

"No use going into details about Joe's sad experiences. It's happened to many an ill-advised farmer.

"This sort of thing makes me angry and choosy enough to buy my supplies from those suppliers that sell to veterinarians only. That's one way to show how I feel about this situation that's upsetting the most effective working relationship in the livestock industry."



AFFILIATED LABORATORIES CORPORATION

WHITE HALL, ILLINOIS

GRAIN BELT SUPPLY CO. THE NATIONAL LABORATORIES CORP.
CORN BELT LABORATORIES, INC. THE GREGORY LABORATORY, INC.

Washington News—continued

Meeting Set on Swine Fever and African Horse-Sickness

The Director of the Food Agricultural Organization, in consultation with the International Office of Epizootics, is sponsoring an emergency meeting to review present situation and future action regarding swine fever and African horse-sickness. Meeting will be held in Paris, France, Jan. 17-20, 1961. Dr. C. D. Van Houweling is chairman of a U.S. Inter-agency Committee arranging for U.S. representation.

Analysis of AEC Radiation Committee Hearings Available

Joint Committee on Atomic Energy, U.S. Congress, Washington, D.C., recently published a summary-analysis of hearings held last spring by the Special Subcommittee on Radiation. Copy of the publication, "Radiation Protection Criteria and Standards: Their Basis and Use," is obtainable on request to the Committee.

STOCKWELL "FULL LINE" VETERINARIAN TABLES

the only "full line" of tables designed to
fit every Veterinarian's needs

ALL NEW FLUOROSCOPIC TABLE

Features attractive specially constructed top—developed exclusively for fluoroscopic work. All non-metallic Formica top is no-glare, non-stain, and scratch proof.

Standard Black Enamel Base model.....\$ 89.50

Deluxe Chrome-Plated Base model..... 109.50

available from
leading suppliers



DELUXE ALL STAINLESS HYDRAULIC TABLE

Rugged-built for "lifetime" service. Super-size operating surface; top tilts and locks; all chromed cast parts; caster mounted for storage and portability. Moderately priced at \$279.50

WRITE FOR SPECIFICATIONS OF ALL TABLES

TED STOCKWELL MFG. CO. — MORENCI, MICHIGAN



ADDITIONAL MODELS

STAINLESS STEEL EXAM TABLE

For pre-surgery treatment. All steel construction. Two models.

STAINLESS STEEL OPERATING TABLE

Economy unit with high priced features. Standard or deluxe.

ALL STAINLESS NON-HYDRAULIC OPERATING TABLE

Finest veterinary table made with best features of any non-hydraulic model.

IN BOVINE MASTITIS

CONSISTENT THERAPEUTIC PERFORMANCE

FURACIN® VETERINARY

BRAND OF NITROFURAZONE

A unique, broad-spectrum antibacterial, FURACIN displays decisive effectiveness against mastitis-inducing organisms often resistant to other therapeutic agents. These include such causative pathogens as *Staph. aureus*, *Str. agalactiae*, *Str. dysgalactiae*, *Str. uberis*, *E. coli* and *Ps. aeruginosa*, sensitive to FURACIN.^{1,2}

Given early in acute cases, FURACIN acts to prevent severe, irreversible udder damage of chronic mastitis that usually results in fibrosis and permanent loss of the cow's milk-producing potential. Thus, by reversing clinical signs of acute infection and arresting the process of induration, FURACIN helps maintain the integrity of the duct system and re-establish normal milk production levels.

A large animal practitioner who has made FURACIN his primary antimastitis agent, summarizes its principal advantages:

- it is a professional product
- there appears to be no development of bacterial resistance
- it is milk-miscible, thus, seems to be totally distributed throughout the injected quarter
- it does not interfere with healing
- is compatible with other agents³

FURACIN SOLUTION VETERINARY SQUEEJET®

Improved intramammary dosage form of FURACIN in a convenient, low-cost single-dose, ready-to-use dispenser.



Contains FURACIN, 0.2%, in a water-miscible base.
Available in SQUEEJETS of 30 cc., boxes of 12.

Note: Milk from cows treated with FURACIN Solution Veterinary should be discarded or used for purposes other than human consumption for at least 24 hours after the last treatment.

FURACIN -PENICILLIN GEL VETERINARY



The broad-spectrum activity of FURACIN is combined with the specific antistreptococcal action of penicillin for additive antibacterial effect.

Contains FURACIN, 2%, and procaine penicillin G (13,333 units per cc.) in peanut oil with aluminum stearate, 3%. In rubber-capped vial of 100 cc., applicator tube of 7.5 cc., boxes of 12.

Note: Milk from cows treated with FURACIN-penicillin Gel should be discarded or used for purposes other than human consumption for at least 72 hours after the last treatment.



References: 1. Kakavas, J. C.; Roberts, H. D. B.; deCoursey, S. J., and Ewing, D. L.: *J. Am. Vet. M. Ass.* 119:203 (Sept.) 1951. 2. Kakavas, J. C.: *Antibiotics Annual 1954-1955*, New York, Medical Encyclopedia, Inc., 1955, p. 323. 3. Jackson, R. A.: *A Program for Mastitis Control*. Read at the Second Regional Conference on the Nitrofurans in Veterinary Medicine, Madison, Wisconsin, May 28, 1959, pp. 23-26.

Available through your professional veterinary distributor.

NITROFURANS—a unique class of antimicrobials—neither antibiotics nor sulfonamides

EATON LABORATORIES, DIVISION OF THE NORWICH PHARMACAL COMPANY, NORWICH, NEW YORK



Nicholson News

news of latest
developments
in veterinary
equipment
by Nicholson

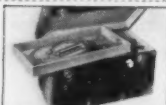
clip and mail today



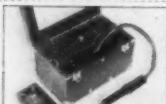
NEW ELECTRIC TATTOO
instrument stops "Collie
Nose" in a hurry just by
tattooing affected area. Send
coupon for free folder.



HOSPITAL SIGN LETTERS of
bright plastic help you
create your own handsome
clinic or hospital sign.
Custom built signs available.
Send coupon for free folder.



NEW VETERINARY CASES of
baked enamel over steel will
"dress up" your visits to
clients. Brass trim, many
sizes, geared to serum
bottles, instruments. Send
for free folder.



ELECTRONIC FIRING IRON
is the only safe, modern
way to fire horses, remove
tumors. A Nicholson labora-
tories invention. Send
for our free folder.



NEW COPON KENNEL PAINT
is our unique plastic finish
that renews old, rusty
kennels; makes them shiny
and bright. Brush, spray or
roll on. Send for free folder.



NEW ELECTRONIC EJACULATOR
is the Trans-Jector. Weighs
only 16½ pounds. May be
operated on 110 or 12 v.
car battery without acces-
sories! Write for free folder.



RADIANT HEAT PANEL makes
a perfect inexpensive, warm
bed for small animals
coming from surgery. Shock-
proof, uses almost no cur-
rent. You just plug it in.
Send for free folder.



B.T.V. BRANDING IRON is all-
electric heats in just 90
seconds! Weighs only 11
ounces. Choice of brands.
Write for free folder.



New Trans-Jector model operates on 12v. current

Shown above is the 1960 model of the Nichol-
son Trans-Jector, the finest electronic bull
ejaculator in the world.

Completely transistorized, this electronic
ejaculator weighs only 16½ pounds. The
probe is only a 3 pound item. Compact, the
unit measures only 18" long by 7" high and
4" wide.

Our Trans-Jector has recently been im-
proved so that now it operates from either 110
volt barn current or 12 volt car battery cur-
rent. Just by changing the power cord! And
no extra charge for this feature.

If you have cattle practice, the Nicholson
Trans-Jector will quickly become an impor-
tant tool in your work. Check the coupon be-
low to receive additional information.

☐ new
electric
tattoo

☐ Plexi-
Sign
letters

☐ veterinary
cases

☐ firing
iron

☐ Copon
kennel
paint

☐ Trans-
Jector

☐ radiant
warmer
panel

☐ branding
iron

Free Information Folders Just fill in this handy coupon, paste
on a postcard and mail. We'll gladly send you our newest
folders about the Nicholson instrument you've checked.
No obligation whatsoever.

DVM

street

city

Nicholson Manufacturing Inc. 3990 Ulster Street Denver 7, Colorado

clip and mail today

clip and mail today

DOES THE CANINE DISTEMPER
VACCINE YOU ARE PRESENTLY
USING AFFORD PROTECTION
TO THE SUSCEPTIBLE ANIMAL
ALREADY EXPOSED AND IN THE
EARLY STAGES OF THE DISEASE?
FOR
20 YEARS THE DISCRIMINATING
VETERINARIAN HAS PROVED THAT
DISTEMPEROID
DOES!

Serving The Veterinarian With Biologicals Of The Highest Standard
FROMM LABORATORIES, INC.
GRAFTON, WISCONSIN, U.S.A.



Unusually hard-to-treat disorders respond



OTITIS EXTERNA

contact

DERMATITIS

cutaneous

MONILIASIS

INTERDIGITAL CYSTS

ANAL GLAND INFECTIONS

ANAL PRURITUS

and many other

**DERMATOLOGIC and NON-DERMATOLOGIC
CONDITIONS in DOGS, CATS**

and other small animals

traumatic

ARTHRITIS and other arthritides

such as

CARPITIS • TARSITIS • GONITIS

NAVICULAR ARTHRITIS

TENDINITIS

TENOSYNOVITIS

as well as

canine

SUMMER ECZEMA

and other non-specific

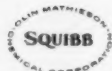
DERMATOSES in

LARGE and SMALL ANIMALS



SQUIBB

A NAME YOU CAN TRUST



to **SQUIBB** veterinary specialties

Panolog

OINTMENT VETERINARY

Squibb Triamcinolone Acetonide, Thioestrepton, Neomycin and Nystatin in Plastibase®

... supplied in 7.5 cc. tubes with elongated tip, each cc. providing:

a potent new corticosteroid developed by Squibb
TRIAMCINOLONE ACETONIDE..... 1.0 mg.

2 antibiotics combined for an unusually broad antibacterial spectrum

THIOESTREPTON 2,500 units

NEOMYCIN (as the Sulfate)..... 2.5 mg.

the first antibiotic specific against *Candida* (Monilia)

NYSTATIN 100,000 units



Vetalog

PARENTERAL VETERINARY

Squibb Triamcinolone Acetonide Aqueous Suspension

... supplied as a sterile aqueous suspension in 5 cc. vials, each cc. providing:

a potent new corticosteroid developed by Squibb
TRIAMCINOLONE ACETONIDE 6 mg.

For literature, write Squibb, Veterinary Department,
745 Fifth Ave., N. Y. 22, N. Y.

PANOLOG — FAST-ACTING "4-in-1" TOPICAL THERAPY for SMALL ANIMALS

Anti-inflammatory: Panolog contains triamcinolone acetonide to provide potent, topical corticosteroid benefits without systemic effects. In laboratory animal tests, triamcinolone acetonide is *40 times more potent* than hydrocortisone acetate, *10 times more potent* than prednisolone. **Antipruritic:** Panolog promotes rapid relief of itching and burning. **Antibacterial:** Panolog contains *two* antibiotics combined for an unusually broad spectrum of activity. **Antifungal:** Panolog contains the first antibiotic specific against *Candida* (Monilia).

Panolog is indicated for a wide range of dermatologic and non-dermatologic disorders of small animals, particularly those complicated by bacterial and/or monilial infection and characterized by inflammatory, edematous and pruritic lesions. Panolog profoundly improves prognosis of acute and chronic otitis externa of varied etiologies. Inflammation and purulent discharge usually subside within 2 to 3 days, followed by rapid healing. Applied as a thin film for various dermatoses... or used as a packing for infected cysts and anal glands... Panolog promotes rapid regression of inflammation and lesions, rapid eradication of infection.

VETALOG — FAST-ACTING, PARENTERAL STEROID THERAPY for HORSES, DOGS and CATS

Vetalog is a highly potent corticosteroid with glucocorticoid activity *90 times greater* than cortisone acetate... with *anti-inflammatory activity 40 times greater* than hydrocortisone acetate and *10 times greater* than prednisolone... and with virtually *no mineralocorticoid activity*.

Arthritis and related disorders: A single intra-articular or intrasynovial injection of Vetalog acts with dramatic swiftness (usually within 24 hours) to decrease pain and improve motion... followed by rapid reduction of inflammation and swelling. Lameness due to articular surface damage is promptly relieved, and restoration of joint function is limited only by the degree of irreversible pathologic change. If initial results are inadequate, dosage may be increased.

Dermatologic conditions: A single intramuscular injection of Vetalog is usually sufficient for rapid termination of symptoms of various dermatoses. Inflammation, edema and pruritus are suppressed and discomfort eased—usually within 24 to 48 hours. Vetalog reduces scratching, thus permitting more rapid healing of lesions.

"PLASTIBASE"®, "VETALOG"® and "PANOLOG"® are Squibb trademarks.

announcing a welcome event...



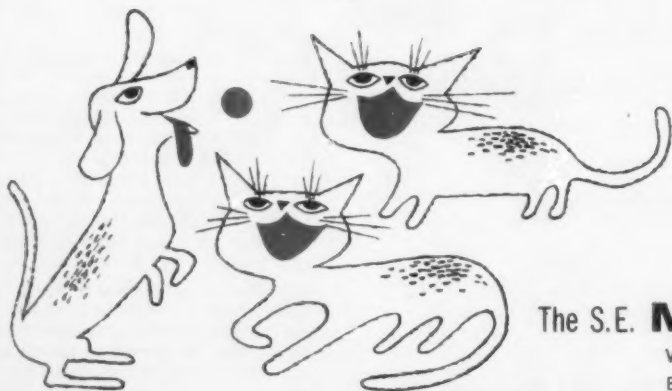
NAME:

pet-tabs, jr.

PARENTS: pet-tabs

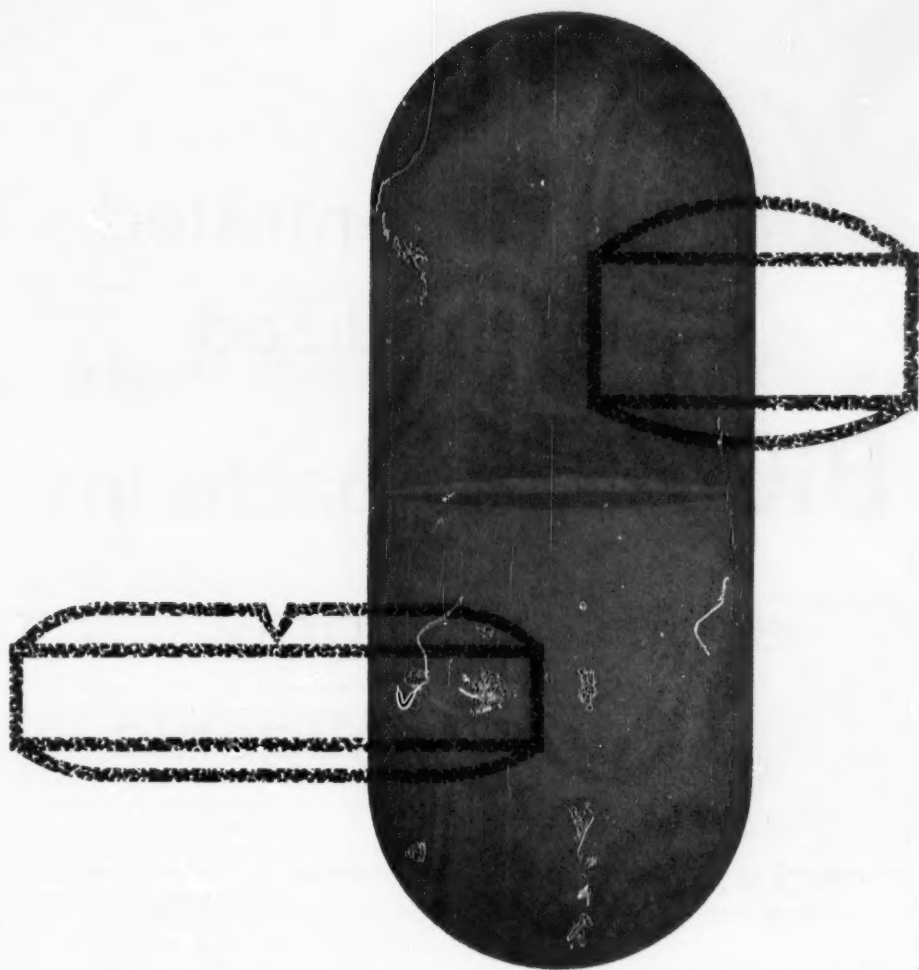
WEIGHT: Just right for cats and toy breed dogs

Young Pet-Tabs, Jr. is the spittin' image of Pet-Tabs—same popular combination of 19 essential vitamins and minerals—only Pet-Tabs, Jr. is smaller, just the right size for cats and toy breed dogs. One tablet a day gives complete nutritional support. They're easy to administer because cats and dogs relish the tasty meat flavor (even storks like them).



The S.E. **M**assengill Company

Veterinary Division
Bristol, Tennessee



*lowest cost therapy for full range
of corticoid-responsive conditions
in cattle and horses—in oral form*

dexamethasone

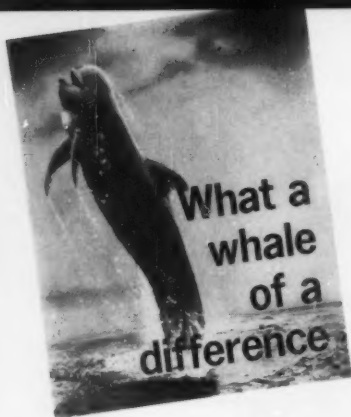
AziumTM

5mg. Boluses

Schering

AZIUM Boluses, 5.0 mg., half-scored, boxes of 30 and 100.
AZIUM Aqueous Suspension, 0.5 mg. per cc. and 2.0 mg. per cc.

SCHERING CORPORATION • BLOOMFIELD, NEW JERSEY



concentrated
standardized
BIOTIZED* bacterins
are more highly
antigenic

Each 2 cc. dose contains 15 billion microorganisms

—three times the number in a 5 cc. dose of conventional product.

exclusive with

FORT DODGE

®

Fortibac*

Coli-staph-strep Bacterin

Recommended as an aid in stimulating resistance to and decreasing the incidence of bovine mastitis.

Bovibac* 3

Mixed Bacterin No. 3

An aid in the control of scours in calves when attributed to organisms named in the formula.

Bovibac 1

Mixed Bacterin No. 1

An aid in prevention of keratitis and pneumonia, when attributed to organisms named in formula.

—and others coming soon

Vol. 138

No. 1

January 1, 1961

Journal

OF THE
AMERICAN VETERINARY
MEDICAL ASSOCIATION

Combination Drug Treatment for

Internal Parasite Infections of Cattle

Leonard E. SWANSON, D.V.M.
A. E. WADE, PH.D.

PHENOTHIAZINE^{5,7} no longer effectively controls *Haemonchus contortus*, *Ostertagia ostertagi*, and *Trichostrongylus axei* in cattle under Florida conditions. *Cooperia* spp., one species of worms which never has been effectively removed by phenothiazine, has been shown to be highly susceptible to piperazine citrate.⁸ This chemical also is effective against the nodular worm, *Oesophagostomum radiatum*, and the lesser stomach worm, *O. ostertagi*. It is less effective against the wireworm, *H. contortus*, bankrupt worm, *T. axei*, and hookworm, *Bunostomum phlebotomum*.⁸ Hexachloroethane is effective in removing adult liver flukes, *Fasciola* spp., and rumen flukes, *Paramphistomum* spp., from cattle.^{1-4,6}

It was believed that a combination of these 3 drugs might be effective in removing most of the internal parasites of cattle. Therefore, experiments were designed to test the efficacy and safety of the combined drugs as an anthelmintic. A combi-



Fig. 1—Parasitized calves on arrival; 2 died from parasitism prior to treatment.

nation treatment should be less expensive because of reduced cost of handling the cattle, even though more expensive per dose. It was hoped that cattle could be treated once, or at most twice, a year with equal or better results than was previously obtained by administering each drug separately at intervals of 2 to 3 weeks.

From the Department of Veterinary Science, University of Florida, Gainesville, Florida Agricultural Experiment Stations' journal series No. 1096.

Acknowledgment is made to Lederle Laboratories and to Chemo Puro Corp. for supplying the piperazine, to Ellfield Laboratories for supplying the hexachloroethane, to E. I. du Pont de Nemours and Co. for supplying the phenothiazine, and to Vitamineral Products Co., for the viatermin mineral supplement used in these experiments.

The authors thank J. R. Crockett, T. C. Ewing, J. L. Fleming, A. N. Jumper, R. Jurado, R. E. Pickels, and F. S. Smith, Jr., for their technical assistance, and Dr. W. M. Lauter, College of Pharmacy, University of Florida, Gainesville, for his advice on formulas.

Materials and Methods

The piperazine citrate used in these experiments was prepared by warming equal quantities of piperazine hexahydrate and citric acid dissolved in water. Purified or N.F. green phenothiazine (wetttable) and powdered hexachloroethane were added. Ferric ammonium citrate, copper sulfate, and cobaltous sulfate were added as a hematinic; methyl and propyl paraben were added as preservatives and a surface

TABLE 1—A Combination of Drugs Used as an Anthelmintic in These Studies

Drug	Quantity
Piperazine hexahydrate	160.0 Gm.
Citric acid	160.0 Gm.
Phenothiazine	100.0 Gm.
Hexachloroethane	100.0 Gm.
Ferric ammonium citrate	10.0 Gm.
Cobaltous sulfate	0.4 Gm.
Copper sulfate	1.0 Gm.
Methyl paraben	0.45 Gm.
Propyl paraben	0.09 Gm.
Tween "80"	10.0 ml.
Water to make	600 ml.

Dosage employed was 60 ml. (2 oz.)/100 lb. of body weight. (Each 2 oz. contained 10 Gm. of phenothiazine, 10 Gm. of hexachloroethane, and the equivalent of 7.1 Gm. of anhydrous piperazine.)

active agent; Tween "80,"* was used to facilitate mixing and suspending the insoluble components. Suspending agents such as bentonite, volclay, or veegum were necessary when the mixture was to be stored (table 1).

The 55 cattle used in these experiments were obtained from herds in Florida where death losses from internal parasitism were currently occurring (fig. 1). They were in poor physical condition and had fetid watery diarrhea and other signs of parasitism. Food was not withheld from the cattle before treatment. They were maintained in groups on pasture with a supplemental maintenance ration of 2 parts citrus pulp and 1 part commercial concentrate containing 16 per cent protein, plus minerals, vitamin supplement, and salt in separate compartments, fed free choice. When pasture was inadequate, hay was provided *ad libitum*. The 4 cattle in experiment 1 were fed 4 lb. of a mineral supplement, 4 lb./100 lb. of supplemental ration. They were given 8 lb. of this ration per animal for the duration of the test. Blood samples were collected every 3 weeks for determination of hemoglobin, packed cell volume, and plasma calcium and phosphorus levels.** All cattle were weighed and their feces were examined for parasite ova at regular intervals. They were examined daily for signs of toxicosis and clinical

*Atlas, distributed by Ruger Chemical Co., 205 W. 17th Street, New York, N.Y.

**Blood analysis was performed by Dr. J. T. McCall, Department of Animal Husbandry and Nutrition, University of Florida.

response. No untreated controls were used except in the last group (table 6).

To obtain preliminary information on the safety and efficacy of the combination of drugs, 1 dose was administered as a single drench to a yearling calf with a heavy parasite infection as determined by fecal examination. No detrimental effects occurred. The treatment removed 100 per cent of *H. contortus*; 81 per cent of *O. ostertagi*; 93 per cent of *T. axei*; 97 per cent of *Cooperia* spp.; 36 per cent of *B. phlebotomum*; and 100 per cent of *Oe. radiatum*, as determined by the critical test procedure that has been described.⁵ The drugs did not remove tapeworms (*Moniezia* spp.), and the calf had no liver flukes (*Fasciola* spp.).

Experiment 1.—Two cows and 2 steers with signs of parasite infections, including profuse diarrhea, were given the combination of drugs. Blood tests and fecal examinations for parasite ova were made every 2 weeks. Results were based on numbers of parasite ova in feces, blood changes, and weight gains.

Experiment 2.—Eight Brahman, crossbred calves in poor condition were pastured in groups of 4 in acre lots. Every 2 weeks, the calves were moved to a different plot. The lots contained pangola, Pensacola, or Argentina bahia grasses. The calves were given 3 treatments of the combination drugs 21 days apart. Results were determined by clinical signs, weight gains, and fecal examinations for parasite ova. No controls were used.

Experiment 3.—Sixteen weakened, parasitized calves were pastured in lots as described in experiment 2 except that all were pastured together and had access to 8 plots. They were moved to different lots every 2 weeks. One group of 8 calves was given the combination drugs upon arrival, and 8 calves in the second group were given water as a drench. Calves in the second group were given the combination drugs 45 days later, at which time calves in the first group were given water.

Experiment 4.—Twenty-seven thin, parasitized calves were allotted to 2 groups and placed on different pasture every 2 weeks. The 14 calves in the first group were given the combination drugs on arrival and again in 6 months; the 13 calves in the second group were given water as a drench on arrival and again in 6 months, and they served as the controls. Fecal examinations, body weights, and clinical signs were recorded every 2 weeks.

TABLE 2—The Effects of a Combination of Drugs on Numbers of Parasite Ova per Gram of Feces and Weight Gains in 4 Cattle

Treatment (No.)	Average ova counts each treatment						Weights of cattle		
	<i>H. contortus</i> and <i>Oe. radiatum</i>		<i>O. ostertagi</i> and <i>T. axei</i>		<i>Cooperia</i> spp.		On arrival	End of 90 days	Gain
	1	2	1	2	1	2	av. lb.	av. lb.	av. lb.
Pretreatment	291	42	381	21	120	24			
Post-treatment	33	21	33	12	18	27	501	671	170
Change (%)	-88.6	-50.0	-91.0	-43.0	-85.0	+12.5			

*Second treatment was given 21 days after the first.

TABLE 3—The Effect of Combination of Drugs on Hemoglobin Concentration, Packed Cell Volume, and Plasma Calcium and Phosphorus in 4 Cattle (Averages)

Treatment (No.)	Hemoglobin (Gm./100 ml.)		Packed cell volume (%)		Calcium (mg./ml)		Phosphorus plasma	
	1	2	1	2	1	2	1	2
Pretreatment	7.1	9.3	26.7	37.7	11.7	12.7	3.8	6.0
Post-treatment	8.2	12.4	28.3	41.8	9.8	9.3	5.0	5.4
Change (%)	+1.1	+3.1	+1.6	+4.1	-1.9	-3.4	+1.2	-0.6

Experimental Results

Experiment 1.—Cattle improved in condition, with an average gain of 170 lb. per head (table 2). A marked increase in hemoglobin concentration and packed cell volume was evident from blood analyses (table 3). The drop in calcium and increase in phosphorus was indicative of a deficiency in phosphorus. They reached the normal calcium and phosphorous range at the conclusion of the test and were returned to the rancher. One cow had a hemoglobin concentration of 3.9 Gm. on arrival and 8.2 Gm. at the end of the experiment. No necropsies were performed on these cattle; however, 1 cow, 6 years old, from this same herd was found at necropsy to harbor 48,800 *T. axei*, 25,600 *O. ostertagi*, and 57,600 unidentified larvae. No other parasites were found, except 2 adult female *B. phlebotomum*.

In most cattle, no parasite ova were found in feces following treatment. Pastures were heavily contaminated and the cattle were subjected to reinfection; consequently, there was a slow build-up of parasitism following treatment. The diarrhea stopped on the third day after treatment and stools were normal throughout the 90 days of the test.

Experiment 2.—The 8 crossbred calves, weighing an average of 170 lb. at the beginning of the experiment (fig. 1), gained

an average of 169 lb. each over the 6 months of the test. After each treatment period, relatively few parasite ova were found, except an occasional *Cooperia* spp. ovum (table 4). Percentage changes in average ova counts were -96 for *Fasciola hepatica*, -96 for *H. contortus*, -80 for *T. axei*, and -93 for *Cooperia* spp. This treatment was safe and effective in cattle, in spite of reinfection from daily consumption of parasite larvae.

Experiment 3.—Calves treated on arrival gained an average of 104 lb., whereas the calves treated 45 days later gained an average of 99 lb. (table 5). The drugs removed 100 per cent of *H. contortus*, *O. radiatum*, *T. axei*, and *O. ostertagi* from the calves and reduced the average ova count of *Cooperia* spp. by 90 to 92 per cent. Whipworms, *Trichuris discolor*, were reduced by 91 per cent in the first group; no *T. discolor* were found in the calves in the second group. There were no other parasites in these calves.

Experiment 4.—The percentage reduction of all ova in the 14 treated yearlings and the 13 untreated controls was 91 to 100 per cent in the treated group, whereas the percentage in untreated control group ranged from -5.6 for *O. ostertagi* (table 6) to 396 per cent. During the 1-year test, treated calves gained an average of 240 lb. each; controls gained an average of 223

TABLE 4—Effect on Parasite Ova per Gram of Feces of 3 Treatments of Combination Drugs at 21-Day Intervals in 8 Cattle

Treatment	Average parasite ova counts									Average weights/head			
	Liver fluke			<i>H. contortus</i>			<i>T. axei</i>			<i>Cooperia</i> spp.			
	1	2	3	1	2	3	1	2	3	1	2	3	
Pretreatment	656	182	22	360	108	42	99	0	9	585	329	216	On arrival
Post-treatment	0	9	1	3	3	3	6	0	3	18	6	36	(lb.)
Change (%)	-100	-95	-94	-99	-97	-93	-94	.....	-67	-97	-98	-83	6 mo.
Average	.....	-96	.....	.....	-96	.....	.....	-81	.....	.....	-93	.....	(lb.)
													Gain/head
													(lb.)

TABLE 5—The Effects of Combination Drug Treatment on Ova per Grams of Feces and Weights in Range Cattle*

Cattle (No.)		Parasite ova (Av. eggs per Gm.)				Av. weight in lb.		
		H. contortus and Oe. radiatum	O. ostertagi and T. axei	Coop. spp.	T. discolor	On arrival	6 mo.	Av. lb. gain/bd.
8 (Treated on arrival)	pretreatment	483	33	954	33	—	—	—
	post-treatment change (%)	0 -100	0 -100	99 -90	3 -91	263	367	104
8 (Treated 45 days later)	pretreatment	612	0	114	0	—	—	—
	post-treatment change (%)	0 -100	0 —	9 -92	0 —	267	366	99

*All pastured and treated as a single group except for dates of drug treatment.

lb. each. Prior to treatment, 1 calf was examined at necropsy for worms. This calf had no adult liver flukes, *F. hepatica*; however, fluke scars were visible which explained the low ova count at the beginning and a large count just prior to the 6-month treatment date. This calf had 10,500 *H. contortus*; 1,900 *O. ostertagi*; 4,200 *T. axei*; 1,200 *Cooperia* spp., and 22 *B. phlebotomum* worms at necropsy. From results of necropsies of 4 principals and 4 controls selected at random at the end of the experiment (6 months after the last treatment), we concluded that cattle must be treated for parasites periodically in order to control reinfection from contaminated pastures (table 7).

Discussion

The combination of drugs used in these tests was chemically compatible; however,

the mixture was unstable and sedimentation occurred after several hours. Perhaps a stable mixture could be prepared by using proper buffers, stabilizers, and smaller particles. The mixture, if used immediately after preparation, was easy to administer with a glass-barrelled dose syringe.

There was no therapeutic incompatibility between the individual drugs in the mixture; in 42 head, clinical signs of parasitic infections rapidly disappeared and fecal ova counts were markedly reduced following treatment. No signs of toxicosis occurred, even though most of the treated cattle were thin and weak.

There was no significant difference in rate of gains between treated and untreated cattle, although fecal ova counts were held to a low level by administration of the combination of drugs and the controls in experiment 4 had heavy parasite loads, judging by their fecal ova counts.

TABLE 6—The Effect of Combination Drug Treatment on Average Ova per Gram of Feces as Compared with Controls*

Treatment No. and No. of cattle	Flukes		Average parasite ova counts							Total gastrointestinal
	F. hepatica	P. cervi	H. contortus	O. ostertagi	T. axei	Cooperia spp.	B. phlebotomum	Oe. radiatum	T. discolor	
14 head										
First treatment										
Pretreatment	21	0	630	768	594	303	226	315	12	2,848
Post-treatment	2	0	0	0	12	3	0	0	0	15
Change (%)	-91	—	-100	-100	-98.8	-99	-100	-100	-100	-99.5
Second treatment										
Pretreatment	222	13	162	12	30	60	3	99	9	375
Post-treatment	0	**	**	**	**	**	**	**	**	72
Change (%)	-100	**	**	**	**	**	**	**	**	-83.8
13 head										
Controls given water										
Pretreatment	25	1	1,095	855	606	257	255	396	15	3,479
Post-treatment	1,015	15	1,539	807	726	398	342	821	24	4,657
Change (%)	+396	+114	+40.5	-5.6	+19.8	+55.9	+34	+107	+60	+57.2

*Total gastrointestinal parasite ova counts these periods. **Total worm ova counted on these periods.

TABLE 7—Parasites Found at Necropsy, 6 Months After Last Treatment

Cattle (No.)	Group	F. hepatica	H. contortus	O. ostertagi	T. axei	Cooperia spp.	Oe. radiatum
31	Treated	0	0	0	1,700	0	38
27	Treated	1	11	800	600	150	4
32	Treated	13	500*	0	0	0	3
25	Treated	0	0	0	200	1,200	4
37	Control	7	2,440**	0	100	1,200	8
38	Control	1	0	0	100	0	0
43	Control	0	0	900	300	0	1
23	Control	3	0	1,000	15,500	0	8

*All immature; **840 mature and 1,600 immature.

This lack of difference in response probably can be explained on the basis that parasitic infections were not heavy enough during the latter part of the experimental period to have caused a serious deleterious effect. This probably is supported by the rather low total worm counts found at necropsy of the controls. Total worm infections were not significantly greater in the controls at the end of the experiment than in the treated animals. The last treatment, however, was given 6 months prior to the time of slaughter.

All cattle were heavily parasitized and had marked clinical signs of infection at the beginning of the study. Both treated and control cattle recovered from parasite infections by the end of the experimental period. Recovery occurred even though the pasture lots were heavily contaminated with parasitic ova and larvae. It is apparent that factors other than treatment may be as important in controlling these infections as were the treatments. The only striking difference between pre-experimental conditions and those present during the study was that all cattle were fed adequate diets, whereas the diets fed before the experimental period were known to be inadequate. It seems likely, therefore, that the diet had a marked effect on the ability of these cattle to develop a satisfactory tolerance to parasites.

It would seem beneficial to investigate in detail the mechanism by which these cattle eliminated heavy parasitic infections almost as rapidly as they occurred when given this highly effective mixture of anthelmintics. This elimination of parasites occurred even though hundreds of cattle left on ranches where the experimental cattle originated continued to have clinical signs of parasitism, and many of them died from these infections. We suggest

that practical control measures, designed to exploit the host's ability to recover spontaneously from infections with gastrointestinal parasites, would be much better than those based upon chemotherapy alone.

Until such procedures have been developed, however, veterinarians and cattlemen must utilize chemotherapeutic procedures for control of gastrointestinal parasites. The combination of drugs used in this study appears to be one of the most effective available treatments for parasitic infections under Florida range conditions.

Summary

1) On the basis of pretreatment and post-treatment fecal ova counts, a combination of phenothiazine (10.0 Gm.), hexachloroethane (10.0 Gm.), and anhydrous piperazine (7.1 Gm./100 lb. of body weight) reduced to ova count of gastrointestinal parasites and liver flukes in cattle.

2) Under a critical test, a single dose of the combination drugs was highly effective in removing *Haemonchus contortus*, *Oesophagostomum radiatum*, *Trichostrongylus axei*, *Cooperia* spp., and *Ostertagia ostertagi*, but had little efficacy (36%) on *Bunostomum phlebotomum*.

3) The combination of drugs, with its wide spectrum of activity, containing phenothiazine, hexachloroethane, and anhydrous piperazine was compatible and safe as an anthelmintic for parasitized cattle in single or repeated doses administered at 21-day intervals.

4) Cattle fed adequate diets spontaneously recovered from heavy internal parasitic infections without specific treatment for parasites, even though they were pastured on heavily contaminated lots.

TABLE 5—The Effects of Combination Drug Treatment on Ova per Grams of Feces and Weights in Range Cattle*

Cattle (No.)		Parasite ova (Av. eggs per Gm.)				Av. weight in lb.		
		H. contortus and Oe. radiatum	O. ostertagi and T. axei	Coop. spp.	T. discolor	On arrival	6 mo.	Av. lb. gain/hd.
8 (Treated on arrival)	pretreatment	483	33	954	33	....	....	....
	post-treatment	0	0	99	3	263	367	104
	change (%)	-100	-100	-90	-91	....	....	....
8 (Treated 45 days later)	pretreatment	612	0	114	0	....	....	....
	post-treatment	0	0	9	0	267	366	99
	change (%)	-100	....	-92	....	....	....	....

*All pastured and treated as a single group except for dates of drug treatment.

lb. each. Prior to treatment, 1 calf was examined at necropsy for worms. This calf had no adult liver flukes, *F. hepatica*; however, fluke scars were visible which explained the low ova count at the beginning and a large count just prior to the 6-month treatment date. This calf had 10,500 *H. contortus*; 1,900 *O. ostertagi*; 4,200 *T. axei*; 1,200 *Cooperia* spp., and 22 *B. phlebotomum* worms at necropsy. From results of necropsies of 4 principals and 4 controls selected at random at the end of the experiment (6 months after the last treatment), we concluded that cattle must be treated for parasites periodically in order to control reinfection from contaminated pastures (table 7).

Discussion

The combination of drugs used in these tests was chemically compatible; however,

the mixture was unstable and sedimentation occurred after several hours. Perhaps a stable mixture could be prepared by using proper buffers, stabilizers, and smaller particles. The mixture, if used immediately after preparation, was easy to administer with a glass-barrelled dose syringe.

There was no therapeutic incompatibility between the individual drugs in the mixture; in 42 head, clinical signs of parasitic infections rapidly disappeared and fecal ova counts were markedly reduced following treatment. No signs of toxicosis occurred, even though most of the treated cattle were thin and weak.

There was no significant difference in rate of gains between treated and untreated cattle, although fecal ova counts were held to a low level by administration of the combination of drugs and the controls in experiment 4 had heavy parasite loads, judging by their fecal ova counts.

TABLE 6—The Effect of Combination Drug Treatment on Average Ova per Gram of Feces as Compared with Controls*

Treatment No. and No. of cattle	Average parasite ova counts									
	Flukes F. hepatica	P. cervi	H. contortus	O. ostertagi	T. axei	Cooperia spp.	B. phlebotomum	Oe. radiatum	T. discolor	Total gastro-intestinal
14 head										
First treatment										
Pretreatment	21	0	630	768	594	303	226	315	12	2,848
Post-treatment	2	0	0	0	12	3	0	0	0	15
Change (%)	-91	....	-100	-100	-98.8	-99	-100	-100	-100	-99.5
Second treatment										
Pretreatment	222	13	162	12	30	60	3	99	9	375
Post-treatment	0	**	**	**	**	**	**	**	**	72
Change (%)	-100	**	**	**	**	**	**	**	**	-83.8
13 head										
Controls given water										
Pretreatment	25	1	1,095	855	606	257	255	396	15	3,479
Post-treatment	1,015	15	1,539	807	726	398	342	821	24	4,657
Change (%)	+396	+114	+40.5	-5.6	+19.8	+55.9	+34	+107	+60	+57.2

*Total gastrointestinal parasite ova counts these periods. **Total worm ova counted on these periods.

TABLE 7—Parasites Found at Necropsy, 6 Months After Last Treatment

Cattle (No.)	Group	F. hepatica	H. contortus	O. ostertagi	T. axei	Cooperia spp.	Oe. radiatum
31	Treated	0	0	0	1,700	0	38
27	Treated	1	11	800	600	150	4
32	Treated	13	500*	0	0	0	3
25	Treated	0	0	0	200	1,200	4
37	Control	7	2,440**	0	100	1,200	8
38	Control	1	0	0	100	0	0
43	Control	0	0	900	300	0	1
23	Control	3	0	1,000	15,500	0	8

*All immature; **840 mature and 1,600 immature.

This lack of difference in response probably can be explained on the basis that parasitic infections were not heavy enough during the latter part of the experimental period to have caused a serious deleterious effect. This probably is supported by the rather low total worm counts found at necropsy of the controls. Total worm infections were not significantly greater in the controls at the end of the experiment than in the treated animals. The last treatment, however, was given 6 months prior to the time of slaughter.

All cattle were heavily parasitized and had marked clinical signs of infection at the beginning of the study. Both treated and control cattle recovered from parasitic infections by the end of the experimental period. Recovery occurred even though the pasture lots were heavily contaminated with parasitic ova and larvae. It is apparent that factors other than treatment may be as important in controlling these infections as were the treatments. The only striking difference between pre-experimental conditions and those present during the study was that all cattle were fed adequate diets, whereas the diets fed before the experimental period were known to be inadequate. It seems likely, therefore, that the diet had a marked effect on the ability of these cattle to develop a satisfactory tolerance to parasites.

It would seem beneficial to investigate in detail the mechanism by which these cattle eliminated heavy parasitic infections almost as rapidly as they occurred when given this highly effective mixture of anthelmintics. This elimination of parasites occurred even though hundreds of cattle left on ranches where the experimental cattle originated continued to have clinical signs of parasitism, and many of them died from these infections. We suggest

that practical control measures, designed to exploit the host's ability to recover spontaneously from infections with gastrointestinal parasites, would be much better than those based upon chemotherapy alone.

Until such procedures have been developed, however, veterinarians and cattlemen must utilize chemotherapeutic procedures for control of gastrointestinal parasites. The combination of drugs used in this study appears to be one of the most effective available treatments for parasitic infections under Florida range conditions.

Summary

1) On the basis of pretreatment and post-treatment fecal ova counts, a combination of phenothiazine (10.0 Gm.), hexachloroethane (10.0 Gm.), and anhydrous piperazine (7.1 Gm./100 lb. of body weight) reduced to ova count of gastrointestinal parasites and liver flukes in cattle.

2) Under a critical test, a single dose of the combination drugs was highly effective in removing *Haemonchus contortus*, *Oesophagostomum radiatum*, *Trichostrongylus axei*, *Cooperia* spp., and *Ostertagia ostertagi*, but had little efficacy (36%) on *Bunostomum phlebotomum*.

3) The combination of drugs, with its wide spectrum of activity, containing phenothiazine, hexachloroethane, and anhydrous piperazine was compatible and safe as an anthelmintic for parasitized cattle in single or repeated doses administered at 21-day intervals.

4) Cattle fed adequate diets spontaneously recovered from heavy internal parasitic infections without specific treatment for parasites, even though they were pastured on heavily contaminated lots.

References

- ¹Alicata, J. E., Swanson, L. E., and Goo, G. W. H.: Methods of Controlling Liver Flukes of Cattle in Hawaii. Hawaii Agric. Exper. Sta. Circ. 15. (1940): 23.
- ²Hall, M. C.: Personal communication, Sept. 28, 1936.
- ³Olsen, O. W.: Hexachloroethane-Dentonite Suspension for Controlling the Common Liver Fluke, *Fasciola hepatica*, in Cattle in the Gulf Coast Region of Texas. Am. J. Vet. Res., 8. (Oct., 1947): 353-366.
- ⁴Swanson, L. E., and Goo, G. W. H.: Liver Fluke Control—Drug Experiments. Hawaii Agric. Exper. Sta. Rep. (1937-1938): 90-93.
- ⁵Swanson, L. E., Porter, D. A., and Connelly, J. W.: Efficacy of Nonconditioned Phenothiazine in Removing Worms from the Alimentary Canal of Cattle. J.A.V.M.A., 96. (June, 1940): 704-707.
- ⁶Swanson, L. E., Batte, E. G., and Dennis, W. R.: Liver Fluke Disease and Its Control. Florida Agric. Exper. Sta. Bull. 502, (1952): 1-19.
- ⁷Swanson, L. E., Dennis, W. R., and Stone, W. M.: Internal Parasites of Cattle, Their Control with Phenothiazine and Management. Florida Agric. Exper. Sta. Circ. S-78, (1954): 1-10.
- ⁸Swanson, L. E., Stone, W. M., and Wade, A. E.: Efficacy of Piperazine Citrate in Removing Worms from the Alimentary Canal of Cattle. J.A.V.M.A., 130, (March 15, 1957): 252-254.

Prolapsed Bladder Resembles Tumor

A client called his veterinarian, stating that a cow from which he had helped deliver a calf the previous day had a large "tumor" hanging from the vagina. The "tumor," which resembled a lipoma, hung 22 inches below the vulva and was 12 inches in diameter. However, on closer inspection, the "tumor" was found to be a completely prolapsed bladder. There was no vaginal wound. The bladder had everted through the urethral orifice. It was emptied with a 14-gauge needle and gradually, with the aid of epidural anesthesia, was replaced through the orifice to its original position and retained with No. 2 catgut sutures placed through the suburethral diverticulum.—*Maine Vet.*, 21, (Oct., 1960): 3.

Cysteamine Therapy for Bovine Ketosis

Thirty-three cows affected with primary ketosis were treated with an aqueous solution of cysteamine hydrochloride. Two or three 750-mg. doses were given intravenously, generally at 3-day intervals.

The milk yield and appetite of 21 of the cows were recorded during the treatment. Blood samples taken from these animals before and during the treatment were analyzed to determine the serum levels of ketone bodies, glucose, pyruvate, α -oxoglutarate, and citrate. In all of the initial samples, these levels deviated considerably from normal.

All 33 cows recovered completely after 2 or 3 injections of cysteamine. Concomitant with the disappearance of clinical signs was a return toward normal of the excessively high levels of ketone bodies, pyruvate, and α -oxoglutarate and of the initially depressed values of glucose and citrate.—*Vet. Rec.*, 72, (Sept. 24, 1960): 797.

Glossitis in Feedlot Cattle

William L. WAKE, D.V.M.

DURING THE SUMMER of 1959, diagnosticians of the Animal Disease Eradication Division, ARS, USDA, were called in 7 instances to investigate suspected vesicular conditions in feedlot cattle reported by veterinary practitioners. One of the 7 suspected cases was investigated in Iowa on May 7. The other 6 were investigated in Illinois; 3 occurred in 1 county on May 4, and 1 occurred in each of 3 counties on July 9, July 11, and August 8. Prior to this time, 3 suspected cases had been investigated in Illinois: 1 in June, 1956, and 2 in June, 1957.

All of the cattle affected were steers. They had been purchased from Wyoming, Nebraska, Iowa, Montana, Colorado, North Dakota, Texas, and Illinois. Some were bought directly from the range, others through brokers. The breeds represented were Hereford, Angus, Shorthorn, and Hereford-Angus cross. All breeds were affected alike. In one instance a purchased herd was divided, half of the steers going to one farm and half to another. Both lots were affected. In another instance, 2 farms bought a herd from the same range and divided it. The condition appeared in one lot and not in the other. The condition had not existed previously on 6 farms investigated, nor was it found on any adjacent farms. In 2 of the cases, additional animals, 1 group of heifers and 1 of steers, were bought and placed in pens adjacent to affected cattle. They received the same feed and were attended by the same personnel, but they did not develop the condition.

The feeding regimen on each farm had been followed for several years with little

change. The rations for the various herds consisted of either whole corn, ground corn, corn and cob meal, or silage. Hay of various kinds and mixtures, ranging from poor to good quality, was fed. Protein supplement of various brands was fed at the rate of $\frac{1}{4}$ to 2 lb. per head with free-choice salt and mineral mixes. One herd received no minerals until the steers were seen licking dirt. Shortly thereafter, the condition was noticed in this herd.

Feeding facilities included open troughs, self-feeders, and elevated hay racks. All were in good condition and cleaned periodically. Common watering tanks or automatic fountains were used. The water source was deep wells.

Clinical Signs

The initial clinical signs were salivation and drooling. Affected cattle were reluctant to eat and found it difficult to get food into their mouths. Within 1 to 3 days, the affected steer stood with his tongue protruding. At this time, a lesion on the tongue became noticeable. The lesion, which proved



Fig. 1—Feedlot cattle with glossitis are characteristically alert and in good condition

The author is supervisory veterinary livestock inspector, Animal Disease Eradication Division, ARS, USDA, Union Stock Yards, Chicago, Ill.

The author thanks Dr. W. G. Evans, assistant veterinarian-in-charge, Springfield, Ill., for the photographic documentation of the lesions described in the report.

to be typical, had the appearance of a deep, interstitial necrosis, affecting the anterior tip or lateral edges. One half to 1 inch of



Fig. 2—Typical tongue lesions and muzzle incrustations as found in feedlot cattle with glossitis.

the tip would slough, leaving an irregular necrotic erosion. In some cases, the lateral edges of the tongue were affected, beginning at the tip, extending posteriorly for 1 to 2 inches, and eroding medially to $\frac{1}{2}$ inch into the musculature.

There was no extension of the lesion to

other parts of the oral cavity. The temperatures and pulses were normal. Breathing through the nostrils was made difficult by dried mucus which formed crusts in the nares and on the muzzle. Small erosions were found under the caked material, some extending into the anterior opening of the nares. With the exception of several steers which had extended growths of the wall of the hoof, no lameness was present.

Discussion

The cattle were not moribund; they remained alert and attempted to eat and drink throughout the illness. In general, the condition of the cattle was good; weight loss was evident in some affected herds but not apparent in others. Morbidity appeared to be 100 per cent in affected herds. The disease required 45 to 90 days to run its course. No mortality resulted.

In all instances, swine were kept with the cattle. In no case were the swine affected.

Specimens were submitted to the ADE Diagnostic Laboratory at Beltsville, Md., for serum-neutralization tests. These proved negative for the "New Jersey" and "Indiana" types of vesicular stomatitis. No satisfactory cause for the condition has been determined.

The condition described in this report agrees with the description offered by Moussu and Dollar,¹ therefore, the term "glossitis" is used in keeping with the specific nomenclature of the part affected.

¹Moussu, G., and Dollar, J. A.W., Diseases of Cattle, Sheep, Goats, and Swine, 1st ed., W. R. Jenkins Co., New York, (1905): 131-132.

Brucellosis Spread by Rabbits

In Denmark, *Brucella suis* (Danish type) infection has been discovered in hares and the occurrence of 3 rapidly spreading enzootics in swine traced to hares.

Brucella infection of hares has also been reported from Switzerland and Germany, and the organisms isolated belonged to all 3 common *Brucella* species. Existence of such reservoirs of infection in wild animals, not only in Europe but also in different parts of the world, has obviously important epizootologic potentialities.—Roy. Soc. Prom. Health J., 80, (Sept.-Oct., 1960): 366.

Mycotic Dermatitis in a Steer

Loren D. KINTNER, M.S., D.V.M.
Donald C. BLENDEN, M.A., D.V.M.

SEVERAL DIFFERENT MOLDS have been reported as etiologic agents of ringworm in cattle. The vast majority of bovine ringworm, however, is caused by *Trichophyton verrucosum*. The mycosis described in this report was apparently caused by the organism, *Scopulariopsis brevicaulis*. The lesion was clearly demonstrated to be mycotic in origin, was histologically distinct, and did not spread to other animals. The organism was consistently isolated to the exclusion of others.

Mention has been made in the literature of this genus of mold causing an infection in a cow. In 1936, it was reported that *Scopulariopsis* produced a lesion on the wrist of a young girl.³ Subsequently, the same organism was isolated from a lesion on the udder of a cow owned by the patient. Other references to this organism are scattered and are concerned with infections in man.^{1,2,5} It is known to produce, primarily, infections of the nails and ulcerogummatous lesions of other parts of the human body. Infection in laboratory animals has been established by intraperitoneal or intratesticular inoculation.⁴

The pathogenicity in rabbits by intraperitoneal inoculation has been demonstrated.⁴ The authors have been unable to establish skin infections in mice, guinea pigs, or cattle.

Case Report

A yearling Shorthorn steer, which was being full-fed in drylot during the month of February, developed a dandruff on the

skin of the loin and rump. No lice or mites were found, but the steer was sprayed with lindane as a precaution. During the next 2 months, the dandruff became more severe, and the corneum thickened to produce wartlike, crustose, confluent masses 5 cm. in diameter, and discrete wartlike



Fig. 1—One of the larger crustose masses which was pulled from the skin of the steer.

nodules 2 cm. in diameter and up to 3 cm. high. These nodules of imperfectly keratinized epithelium had a relatively dense shell consisting of embedded hair, keratinized epithelium, and dried serum. The core consisted of the same material, but it was less compact. The wartlike growths, although they were tightly adhered, particularly by the imbedded hair, could be pulled off with relatively little discomfort to the steer (fig. 1). The detached nodule left a peripheral circular band of shallow erosion which was cherry red and oozed plasma. The central zone was covered with relatively intact epidermis. An area of skin, limited to the rump and loin, several feet in diameter was involved (fig. 2, 3). The hair was relatively sparse in the affected area. There was no evidence of itching or

From the Departments of Pathology and Veterinary Bacteriology and Parasitology, School of Veterinary Medicine, University of Missouri, Columbia.

The authors acknowledge the assistance of Mr. Al Novick, Missouri Division of Health Laboratories, for the examination of cultures and of Drs. H. C. McDougale and M. Wykoff for the photomicrography.



Fig. 2—Lesions over the loin and rump of an affected steer.



Fig. 3—A close-up view of rump of steer shown in figure 2, in which the lesions are shown in greater detail.

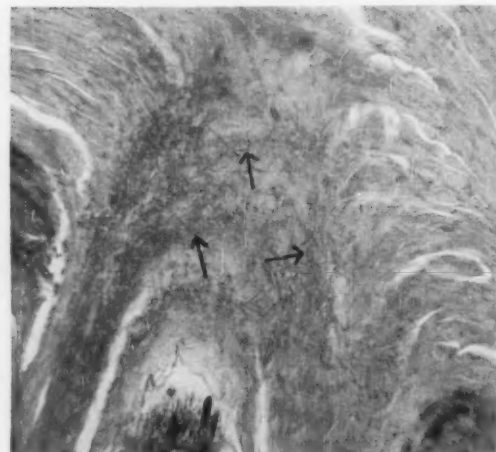


Fig. 4—Hyphae are present in large numbers in this section of corneum (arrows); $\times 800$.

tenderness. This steer finished as well as the others in the lot, none of which developed any skin lesions.

Histologically, the small vessels throughout the dermis were found to be conspicuous because of perivascular infiltration of lymphocytes. There was a light infiltration of lymphocytes, plasma cells, and histiocytes around the skin adnexae, with massive concentration of these cells in the upper dermis adjacent to the epidermis. The hair shafts were well preserved. The sweat glands were distended and contained a little basophilic, lacy material.

The rete pegs were elongated and broadened. Mitotic figures were prevalent in the germinal layer. The malpighian layer was increased in thickness several times. The granular layer was thin and absent in some areas. The corneum was thickened to a depth of several centimeters, with parakeratotic and keratinized epithelium. Fungus hyphae were present in great quantities throughout the corneum (fig. 4) but did not penetrate the prickle cell layer. The hyphae took a heavy basic stain with hematoxylin and formed long filaments with limited branching and were concentrated in the keratinized epithelium about hair shafts but they did not invade the hair. Hyphae were concentrated also in the epithelium that was compressed and well keratinized, as in the base of folds. The intervening parakeratotic epithelium was much less heavily invaded. A few small nests of neutrophils were widely scattered in the corneum at the sites of heavy mycelium concentration.

A microscopic mycologic examination was made of the superficial keratin layers under the heavy crusts. Small flakes of this material were mounted in a solution of 10 per cent potassium hydroxide on a slide with a coverslip and allowed to clear for 30 minutes before examination. Under low and high power observation, the flakes were found to be literally filled with hyphae. No conidia were observed. There was no evidence of hair invasion, either grossly or microscopically.

Material from these lesions was inoculated into Sabouraud's dextrose agar and into a phytone-dextrose agar medium containing 0.04 per cent cyclohexamide and 0.005 per cent chloromphenicol.* Also,

*Mycosel Agar, Baltimore Biological Laboratories, Baltimore, Md.

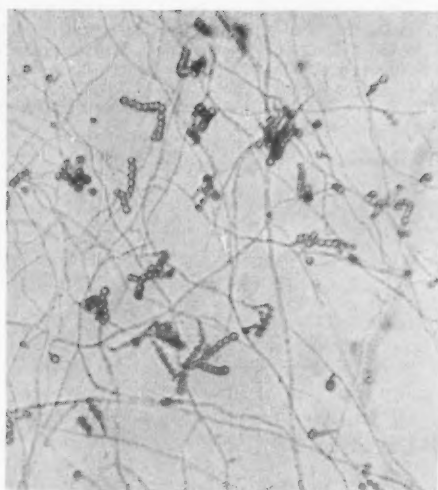


Fig. 5—Low-power view of slide culture shows chains of conidia on septate hyphae; $\times 100$.

these mediums enriched with 0.01 mg. per liter of thiamine hydrochloride were incubated at 37 C. in an effort to isolate *T. verrucosum*.

One organism was consistently isolated from these materials on all mediums and at both room temperature and 37 C. This growth was evident at about 4 days of incubation and produced slightly wrinkled, cinnamon brown colonies in 10 to 14 days. Subcultures of the mold on plain Sabouraud's dextrose agar resulted in rapid growth of nonsporulating colonies, indicated by the absence of the cinnamon

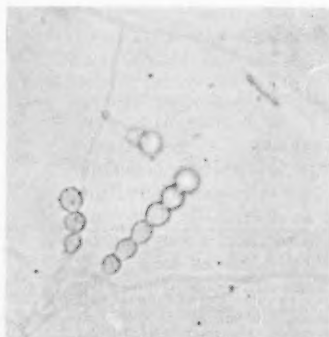


Fig. 6—High-power view of slide culture reveals branched, septate hyphae, a branched conidiophore, and chains of lemon-shaped rough-walled conidia; $\times 430$.

brown color and reproductive bodies. Inoculation on blood agar and rice grains medium after incubation consistently produced typical growth and stimulated the production of conidia.

Microscopic examination of a portion of the cinnamon brown mycelium mounted in lactophenol cotton blue revealed rough-walled, lemon-shaped conidia in short chains supported by branched conidiophores. The conidia were approximately 10 μ in diameter. Many conidia were lying free in the mounting medium, indicating a delicate attachment and that long chains are actually produced in growth. Slide culture confirmed these findings by producing chains of pale yellow conidia (fig. 5, 6).

Repeated attempts to isolate *T. verrucosum* were made by utilizing several series of thiamine-enriched mediums incubated at 37 C. for 6 weeks. Different areas of the lesions were selected, and all were shown, by microscopic examination, to be heavily invaded by the mold, *Scopulariopsis*. *Trichophyton verrucosum* was never isolated.

Wartlike nodules of the type described above have been sent in by practitioners on previous occasions. The disease usually has occurred in beef animals during the winter months. Lesions have been reported on the neck and brisket more often than on the rump. The disease has usually been sporadic, with only several cattle in the group being affected. It was observed on cattle that were poorly fed and that had long hair, so the lesions could be palpated but not seen until the hair was parted. However, most of these mycoses occurred in feedlot steers that appeared to be well nourished and in close confinement. One group of cattle made an uncomplicated recovery after application of iodine and manual removal of the larger crustose masses.

This mycosis in a steer is thought to represent an infection by the mold, *S. brevicaulis*. It was not the same as the usual bovine ringworm, judging by histopathologic and microbiologic analyses. Differentiation of the genus, *Scopulariopsis*, into species does not seem clear-cut. This organism is presumed to be *S. brevicaulis* because of its morphologic characteristics.

References

- ¹Conant, N. F., Smith, D. T., Baker, R. D., Callaway, J. L., and Martin, D. S.: Manual of Clinical

Mycology. 2nd ed. W. B. Saunders Co., Philadelphia, Pa., 1954.

²Dodge, C. W.: Medical Mycology. C. V. Mosby Co., St. Louis, Mo., 1935.

³Markley, A. J., Philpott, O. S., and Weidman, F. C.: Deep Scapulitis of Ulcerating Granuloma

Type Confirmed by Culture and Animal Inoculation. Arch. Dermat. and Syph., 33, (1936): 627-641.

⁴McCune, E. L.: Unpublished data, Department of Veterinary Bacteriology and Parasitology, University of Missouri, Columbia. 1959.

⁵Simmons, R. D. G.: Medical Mycology. Elsevier Publishing Co., New York, 1954.

African Ticks Found at 2 U.S. Locations

Discoveries of red ticks, *Rhipicephalus evertsi*, on zoo animals near Tampa, Fla., and Hudson, N.Y., mark the second and third reported occurrences of this livestock pest in the United States within a month.

Although widely separated geographically, both new infestations have been traced to a recent shipment of 14 zebras from Kenya, East Africa. The animals were enroute 28 days and underwent a 30-day quarantine in the United States before they were released to zoos. The tick is a carrier of East Coast fever and a potential vector of cattle tick fever.

First discovery of red ticks in the United States was announced Oct. 4, 1960, by USDA officials when the pest was found in an animal compound near Boca Raton, Fla. (see J.A.V.M.A., Nov. 15, 1960: 584).—USDA Release, Nov. 4, 1960.

Foot-and-Mouth Disease Virus Proves Highly Stable

In the past, it was shown that foot-and-mouth disease (FMD) virus was destroyed by heating to 140 F. or higher. However, recent experiments at Plum Island have shown that heat treatment only seals the infectious core within the protein covering of the virus and in this way blocks its ability to infect susceptible animal cells. Once the protein covering is chemically removed, the cores become infectious. Infectious nucleic acid cores may be obtained from virus which has been boiled for as long as 5 minutes. Consequently, meat from animals infected with FMD is not rendered free of virus by the usual procedures of ripening, boning, salting, and storage. It can survive in residual blood or lymph nodes of boned, salt-cured meat for at least 50 days and in bone marrow in refrigerated carcasses for at least 73 days.—USDA release, March 28, 1960.

Distal Epiphyseal

Fracture of the Femur

in a Shetland Pony

G. D. PETTIT, D.V.M.

J. D. WHEAT, D.V.M.

ON MAY 6, 1960, a 1-year-old Shetland filly weighing 140 lb. was presented for treatment of a femoral fracture which had been present for 2 days. The cause of injury was unknown. It occurred while the pony was in a pasture with other horses.

Radiographs revealed a distal epiphyseal fracture of the right femur, with the epiphysis displaced posteriorly and rotated laterally (fig. 1).

Surgery was performed on May 9, 1960. General anesthesia was induced and maintained by intermittent intravenous pentobarbital sodium. Muscle relaxation was attained by administering succinylcholine chloride. The patient was placed in left lateral recumbency, and a surgical field was prepared over the fracture. A curving, longitudinal incision was made on the anteromedial aspect of the stifle, just medial to the patella. The skin, subcutaneous tissue, medial femoropatellar ligament, and joint capsule were incised, exposing the stifle joint, the femoral epiphysis, and the fracture. Because of the rotation of the distal fragment, the patella was already luxated laterally. The patella was temporarily displaced even farther laterally to provide adequate exposure of the fracture.

Blood clots were removed manually, and adhesions at the fracture site were removed by blunt dissection. A Steinmann pin, $\frac{1}{4}$ inch in diameter with a trocar point, was introduced into the femoral epiphysis from its articular surface, in the groove of the trochlea. The pin was inserted until its tip protruded slightly from the fracture surface. Reduction was accomplished by engaging the tip

From the School of Veterinary Medicine, University of California, Davis.

Fig. 1—Lateral radiograph of right femur of a Shetland pony. Distal epiphyseal fracture with posterior displacement and lateral rotation of the distal fragment are shown.

Fig. 2—At surgery, the Steinmann pin was introduced from the articular surface of the femoral epiphysis. Reduction has been partially accomplished by using the pin as a lever.

Fig. 3—Reduction of the fracture has been completed, and the pin has been severed and countersunk.



of the pin in the end of the proximal fragment and using the pin as a lever to swing the epiphysis forward into its normal position (fig. 2). Several attempts were required, but successful reduction was finally achieved when 7 mg. of succinylcholine chloride was administered intravenously in conjunction with manipulation of the pin.

The pin was driven the full length of the medullary cavity of the femur until its tip was imbedded in the cortex near the trochanteric fossa. The pin was severed at the point of entry and was countersunk beneath the surface of the articular cartilage (fig. 3). The patella was replaced in the groove of the trochlea. The joint capsule and the medial femoropatellar ligament were each reunited with simple interrupted sutures of No. 1 chromic catgut. The subcutaneous tissue was sutured with simple continuous sutures of No. 1 chromic catgut, and the skin incision was closed with horizontal mattress sutures of No. 3 monofilament nylon.

Supplementary support was provided for 3 weeks by means of a modified Thomas splint. No sling or other mechanical elevating device was required because the patient was ambulatory upon recovery from anesthesia. Penicillin and dihydrostreptomycin were administered intramuscularly twice daily for 2 weeks. An intramuscular injection of 100 mg. of prednisolone was administered daily for 3 days to minimize the inflammatory reaction within the joint.

The patient was discharged 1 month after removal of the modified Thomas splint, at which time she was beginning to place weight on the leg.

Discussion

The technique of pinning distal epiphyseal fractures of the femur from the distal end of the bone has been described previously in dogs.¹⁻³ It is the preferred procedure used for reducing this type of fracture in the small animal clinic of this university. This case is believed to be the first recorded application of the method in a species other than the dog.

The original description of the procedure recommended that the pin be passed through the medullary cavity of the proximal fragment until its point emerged through the skin over the trochanter major.¹ It was severed there and could be withdrawn through the proximal end of the femur after the fracture had healed. A later report described the method utilized here (the pin was buried permanently within the femur).² The possibility of eventual migration of the pin distally into the stifle joint would appear to be the major objection to leaving it buried within the bone. In the case presented here, the pin was driven securely into the cortex at the proximal end of the bone. As the pin entered the proximal fragment, it was directed toward the anterior wall of the medullary cavity, which deflected it and bowed it slightly. As a result, the pin was wedged within the bone in the manner of a Rush pin, and migration of the pin seemed a remote possibility.

Immobilization of the fracture was adequately achieved by the pin alone. The modified Thomas splint was applied only as a precaution against additional injury to the leg during early convalescence.

Summary

A distal epiphyseal fracture of the femur in a Shetland pony was successfully treated, using open reduction with fixation by an intramedullary pin introduced from the distal end of the femur. Although this technique is a recognized procedure in small animals, this is believed to be the first recorded application of the method in the equine species.

References

- ¹Armistead, W. W., and Lumb, W. V.: Management of Distal Epiphyseal Fractures of the Femur. *North Am. Vet.*, 33, (1952): 481-483.
- ²Boyce, G. K.: Fractures of the Distal Extremity of the Femur. *Canadian J. Comp. Med. & Vet. Sci.*, 21, (1957): 234-236.
- ³Butler, H. C.: Fixation of Distal Epiphyseal Fractures of the Femur. *Western Vet.*, 5, (1958): 44-48.

Digitalis Increases Serum Potassium Levels

Results of a study in dogs suggest that digitalis may induce significant hyperkalemia in the presence of uremia or metabolic acidosis. Alterations of permeability of the cell membrane could explain this finding.—*Am. Heart J.*, 60, (Sept., 1960): 388.

African Horse-Sickness

African horse-sickness, long confined to Africa, is now spreading in the eastern Mediterranean area and Southeast Asia, where it is causing such serious losses among the equine species as to be of international significance. It is estimated that 150,000 horses, mules, and donkeys have died as a result of this disease within the last few months.

African horse-sickness is an insect-borne viral disease of the equine species, characterized, in its acute form, by a highly fatal pulmonary edema.

In view of the presence of African horse-sickness in an increasing number of countries, the nearly world-wide distribution of *Culicoides* vectors, and the demonstrated ability of the disease to spread great distances, veterinarians everywhere must now be alert for the disease. The speed, volume, and geographic scope of modern travel and trade have resulted in the emergence of several viral diseases to which animals in all countries are increasingly vulnerable.

Although mild or chronic cases may occur in resistant animals, originally exposed horses and mules usually develop the acute pulmonary form. Affected horses develop a fever which rapidly reaches 105-106 F. and which is soon followed by acute clinical illness. Horses which appeared normal the day before may be found standing with their forelegs apart, head down, ears drooping, nostrils dilated, coughing, and sweating. Respiration becomes increasingly labored and difficult; within a few hours, an edematous froth appears in their nostrils, and death soon follows. At necropsy of animals acutely affected, there are usually excess pleural and peritoneal fluids and pulmonary edema, often with edema of the regional lymph nodes. Edema of the digestive tract and acute passive congestion of the liver may be expected. In the chronic or cardiac form, endocardial hemorrhage and myocardial degeneration are prominent, along with severe subcutaneous edema of the head and neck, especially of the supra-orbital fossae.

The virus is present in all body tissues and fluids during the illness. It may be recovered by the intracerebral inoculation of

infant mice with defibrinated blood collected during the period of viremia. The diagnosis may be confirmed by neutralization of the virus with known African horse-sickness immune serum in the mouse.

Known in Africa since about 1700, this disease has long been a major scourge of

At the Nov. 14-15, 1960, meeting of the Council on Public Health and Regulatory Veterinary Medicine, it was decided that the danger of African horse-sickness being introduced into the United States was great enough that all practicing veterinarians should be alerted. At the request of the Council, this statement was prepared by Colonel F. D. Maurer, Chief, Veterinary Pathology Division, Armed Forces Institute of Pathology, Walter Reed Army Medical Center, Washington, D.C.

horses and mules, with a mortality rate up to 90 per cent in susceptible horses. The occurrence and distribution of the disease are associated with nocturnal biting insects, especially *Culicoides* species. Although readily spread by *Culicoides*, and possibly other biting insects, the disease is not directly transmissible from 1 horse to another. Within 10 days of a killing frost and disappearance of the insect vectors, no new cases appear. In enzootic areas of South and Equatorial Africa, there is believed to be a silent, nonequine reservoir host which harbors the virus between insect seasons. When introduced beyond these enzootic areas, the disease has disappeared with the vectors and has not reappeared with the return of vectors except after a new introduction of the disease from an enzootic area.

In the summer of 1959, the disease first

appeared in Iran, West Pakistan, and Afghanistan. Instead of dying out over the winter, it reappeared in the early spring of 1960, and spread rapidly, both eastward to India and westward to Iraq, Syria, Turkey, and Cyprus. This persistence over the winter may be due either to the continuous presence of flying insect vectors or the presence of a reservoir host. In either case, it appears entrenched there and is likely to reappear in the spring of 1961.

Although this is primarily a disease of the equine species, dogs may be infected by the ingestion of infected meat.⁶ It is not known whether dogs are involved in the insect transmission of the disease. Most species of small laboratory animals may be infected experimentally, with the exception of the rabbit.⁴ The successful serial intracerebral passage of the virus in mice has provided a practical means of typing strains and has led to the development of an attenuated virus vaccine.^{1,2} South African workers^{3,5} have shown that there are at least 42 different strains of virus, 7 of which are used in a polyvalent attenuated virus vaccine. This South African vaccine has proved effective against the disease in the eastern Mediterranean area and South-east Asia.

There are approximately 12 million horses, mules, and donkeys in the affected countries of this area. The westward spread of the disease in Turkey and to Cyprus increases the vulnerability of the countries coastal to the Mediterranean which are now free of the disease, where

there are some 12 million more animals of the equine species. In both regions, the people are largely dependent upon these animals for agricultural power and transportation.

Practicing veterinarians everywhere should review the clinical signs of this disease, and should report suspicious cases to the livestock disease officials. Only by prompt recognition and reporting, is it likely that catastrophic losses due to African horse-sickness can be prevented in a country where it has not previously occurred.

References

- ¹Alexander, R. A.: Studies on the Neurotropic Virus of Horsesickness. *Onderstepoort J. Vet. Sci. and Anim. Indust.*, 4, (1935): 291-322, 349-377, 379-388.
- ²Alexander, R. A.: Studies on the Neurotropic Virus of Horsesickness. *Onderstepoort J. Vet. Sci. and Anim. Indust.*, 7, (1936): 11-16.
- ³Alexander, R. A., Neitz, W. O., and Du Toit, P. J.: Horsesickness: Immunization of Horses and Mules in the Field During the Season 1934-1935 with a Description of the Technique of Preparation of Polyvalent Mouse Neurotropic Vaccine. *Onderstepoort J. Vet. Sci. and Anim. Indust.*, 7 (1936): 17-30.
- ⁴Henning, M. W.: Animal Diseases in South Africa, 3rd ed. Central News Agency LTD, South Africa, (1955): 785-808.
- ⁵McIntosh, B. M.: Immunological Types of Horsesickness Virus and Their Significance in Immunization. *Onderstepoort J. Vet. Res.*, 27, (1958): 465-538.
- ⁶Piercy, S. E.: Some Observations on African Horsesickness Including an Account of an Outbreak Amongst Dogs. *East African Agric. J.*, 17, (1951): 1-3.

Quarantine Against African Horse-Sickness

To prevent entry of African horse-sickness into this country, the USDA has announced a minimum 30-day quarantine of horses, donkeys, mules, and zebras being brought into the United States from countries of Asia, the Mediterranean area, and Africa.

Importers must hold equine animals entering this country in insect-proof facilities approved by ARS for the 30-day observation period. Previously, they have not been detained after passing physical examinations and blood tests for dourine and glanders—2 diseases that have been eradicated from the United States.—USDA Release, Washington, D.C., Nov. 14, 1960.

Mastitis and the Antibiotic Problem

Harold R. IRVIN, M.P.H.

IN AN EFFORT to learn how practicing veterinarians in Nebraska view problems concerning mastitis and antibiotic contamination of milk, a questionnaire was sent to 356 veterinarians. Through the answers, we hoped that the educational program being carried on in the Omaha milkshed by the Omaha-Douglas County Health Department and the Nebraska-Iowa Non-Stock Co-op Milk Association would be aided. Completed questionnaires were returned by 166 veterinarians. The questionnaire was divided into 4 parts (A, B, C, and D). A summarization of questions and replies follow:

Effects of Antibiotics on the Incidence of Mastitis

1) Is mastitis more difficult to handle in situations in which antibiotics have been used promiscuously? Respondents answering yes, 99 per cent.

2) Do antibiotics used promiscuously lose their therapeutic value? Yes, 99 per cent.

3) Do you believe that the incidence of the disease has decreased in the past 5 years due to the use of antibiotic treatments? The incidence of mastitis was thought by 24 per cent to have decreased due to antibiotic treatment. The Omaha-Douglas County Health Department reported that in spite of new methods of treatment, such as chemotherapeutic drugs and antibiotics, mastitis continues to be a major problem for the Nebraska dairy milk producer. About 96 per cent of the Nebraska herds either have or have had mastitis. In only 4 per cent of the 700 investigated was no trace of mastitis found. The incidence of mastitis per herd was found to be 30 to 40 per cent in 85 per cent of the herds and 50 to 70 per cent in the rest of the herds tested.

The author is chief milk sanitarian for the Omaha-Douglas County Health Department, Omaha, Neb.

4) Have you seen more severe udder irritation resulting from antibiotic infusion than from the original mastitis infection for which they were used? Yes, 36 per cent.

5) Do you think farmers withhold milk from market for a sufficient time following treatment? Ninety per cent stated that they believed farmers withheld milk for a sufficient time. The antibiotic study being carried on by the Omaha-Douglas County Health Department indicated that 99 per cent of the farmers are withholding milk from market for a sufficient time following treatment.

6) Do you believe that milk from all 4 quarters should be discarded following udder infusion? Milk from all quarters should be discarded according to 55 per cent of the respondents. Scientific research has indicated each quarter should be regarded as a separate and independent unit, a fact which is accepted by veterinarians and research workers in general.^{2,5} This was the reason some veterinarians thought that it would be all right to send in the milk from noninfected quarters. They believed that the antibiotic infused in one quarter would not appear in the others. A sanitarian or fieldman is perfectly safe in advising a producer against using milk from an infected cow because milking and handling is done in such a way that it would be almost impossible not to contaminate the clean milk. Milk from a treated cow should, therefore, be discarded until the time when no antibiotic or infection is detected in any quarter.

7) Do you think milk from all 4 quarters should be discarded following parenteral treatment? Yes, 78 per cent. Through clinical research, the antibiotic has been proved to be in all 4 quarters from 5 to 7 days after parenteral treatment.^{1,3,4,6}

8) Do you believe that milk from infected cows should be heat-treated before it

is fed to calves? Fifty-five per cent stated that it should; 27 per cent said it should not be fed to calves at all; 18 per cent felt it would be all right to feed the milk to either calves or pigs.

Effective Treatment for Cows with Mastitis

1) Do you treat the udders of dry cows that have had mastitis previously? Yes, 77 per cent.

2) What antibiotic do you find most effective for control of mastitis? In answer, veterinarians stated penicillin, streptomycin, chlortetracycline, and oxytetracycline were the most common antibiotics used in mastitis therapy.

3) How do you treat mastitis on farms where farmers have used all available udder infusions? Parenteral treatment of cows was recommended by 87 per cent; 5 per cent used stronger doses of antibiotic infusions than are available to the average producer; 39 per cent used a staphylococci-streptococci bacterin and organic iodine as a feed additive along with antibiotics used parenterally. Many recommend culling cows with chronic mastitis, obtaining cultures from infected udders, and use of a specific antibiotic on the basis of the organisms present on culture. Few even suggested a "shot-gun" method. The majority said medication and "shot-gun" therapy could not replace good management, for "shot-gun" therapy used as an approach to control of mastitis would merely be furnishing the producer with a rather inexpensive source of peace-of-mind and would delude him into a false sense of security. Many found that mastitis in the udder merely indicated an infection was present some place in the body and was manifesting itself in this local area. Less than 8 per cent indicated they would isolate the cow.

Udder and Teat Cup Sanitation for Mastitis

1) Do you recommend milking infected cows last? All stated that they did.

2) Do you recommend that individual cow towels immersed in warm disinfectant should be used? Ninety-two per cent said that this was a good practice.

3) Do you recommend that milkers wash and disinfect their hands after milking? The producer should wash his hands, 96 per cent.

4) Do you recommend teat cups on the milking machines be disinfected between cows? Yes, 97 per cent.

Mastitis-Antibiotic Control

1) Do you favor restriction of antibiotics to the profession? Yes, 85 per cent. They believed that if antibiotics were restricted to the profession, the amount of milk contamination would be reduced, since they would be able to select proper therapy better than the farmer. They also said that restriction would discourage farmers from adding antibiotics to bulk milk to lower its bacterial count. Ten per cent suggested that antibiotics not be made available to veterinarians.*

2) Do you think farmers should be informed of the limitations of antibiotics? Yes, 93 per cent. The majority stated that the farmer should be impressed with the importance of a good control program rather than with the use of antibiotics. Unless the farmer had a sincere desire to prevent and control mastitis, they believe a satisfactory program could not be worked out. Actually a large part of the program would be preventive medicine, which is often difficult for a farmer to appreciate. It appears that some producers think that as long as the cows' udders seem all right, they do not have to take preventive steps. Dairymen who realize how much mastitis costs from year to year are usually willing to consider prevention.

3) Do you think udder-infusion medications should be colored? Yes, 77 per cent.

4) Do you think the health department should check on the presence of antibiotics? Yes, 97 per cent.

5) Do you believe dairymen have been the victims of advertisers? All stated that the dairymen have been victimized by advertisers. The veterinarians said that they themselves had been thoroughly and completely victimized by advertisers, too.

The Mastitis-Antibiotic Problem

The majority of those returning the questionnaire believed that failure to restrict antibiotics to the profession was the

*This comment from those returning the questionnaires favored making antibiotics not available to veterinarians for mastitis treatment, because they believed the veterinarian would then devote more time to educating the producer and concentrate all efforts on the contributing factor causing mastitis, rather than trying to cure it.

main reason for the problem's remaining unsolved. Many said that the farmer should be taught about the limitations of antibiotics and that there was no substitute for an accurate diagnosis which usually involves laboratory work. They stated that bacteriologic examination of milk samples is the only way to detect all cases of udder infection.

The veterinarians said that the following precepts must be incorporated in order to provide a good control program. (1) Udder infusion preparations should contain not more than 100,000 units per dose. (2) Treatment alone should not serve as the basis for controlling mastitis. (3) The producer must follow good milking practices. (4) Cows with chronic mastitis should be removed from the herd and slaughtered. (5) No matter how good a program is, mastitis in some cows can not be prevented. (6) A mastitis-free herd requires 2 to 5 years to develop. (7) Sanitation must be practiced continually.

Evaluation and Summary of the Survey

That 166 of the 356 veterinarians completed this questionnaire indicates concern about the contamination of milk with antibiotics and interest in the control of mastitis. Many veterinarians who returned questionnaires were from the western part of Nebraska where there are few herds of dairy cows. Many volunteered valuable clinical data and comments indicative of their interest. They emphasized that an extension of our educational program to farmers is needed. The veterinarians did not agree on many questions, but they all believed that the present approach to control mastitis is inadequate.

The study pointed out that there has been a substantial amount of research on infectious agents as causes of mastitis, and that there has been a lack of research in

the area of defining by actual measurements—circumstances which produce changes in the cow herself which may predispose her to infection. It appears that mastitis can not be eradicated by laboratory testing programs, as so many other diseases have been. Better herd management practices would have a greater effect on the control of mastitis than merely identifying carriers. Laboratory services for bacterial identification and antibiotic sensitivity testing to improve therapy was recommended by 85 per cent.

Nebraska veterinarians believe that the Nebraska Health Department needs to emphasize better milking techniques, although such a program has been carried on by extension people for years. They said that any program must continually stress strip cup usage; udder, barn, and equipment sanitation; milking of infected cows last; elimination of cows with chronic mastitis from the herd; and discontinuation of over-the-counter sales of antibiotics to farmers.

References

- ¹Bell, W. B., Flora, C. C., Reaves, P. M., and Holdaway, C. W.: Aureomycin Concentration in Milk Following Intramammary Infusion and Its Effect on Starter Activity. *J. Dai. Sci.*, 34, (1951): 675.
- ²Blackburn, P. S., Laing, C. M., and Malcolm, J. F.: Letters to the Editor. *J. Dai. Res.*, 22, (1955): 37.
- ³Bryan, C. S.: Problems Created for the Dairy Industry by Antibiotic Mastitis Treatment. *Michigan Agric. Exper. Sta. Quart. Bull.*, 33, (1951): 223.
- ⁴Clazbaugh, G. A., and Nelson, F. E.: The Effect of Antibiotic in Milk: A Review. *J. Milk and Food Technol.*, 14, (1951): 155.
- ⁵Laing, C. M., and Malcolm, J. F.: The Incidence of Bovine Mastitis with Special Reference to the Non-Specific Condition. *Vet. Rec.*, 28, (1958): 447-455.
- ⁶Randall, W. A., Durbin, C. G., Wilmer, J., and Collins, J. H.: Antibiotics Concentration and Duration in Animal Tissue and Body Fluids. I. Blood Serum and Milk of Cows. *Antibiotics Annual*, 1953-1954. Medical Encyclopedia, Inc., New York, N.Y.

Veterinary Antibiotic Use Increases

According to reports of the U. S. Tariff Commission, Washington, D.C., in 1958, 187 tons and, in 1959, 204 tons of bulk antibiotics were used in veterinary treatment. Approximately 50 per cent was used for the treatment of mastitis.—*Dr. H. G. Hodges, Proc. Mastitis Conf., Oct. 29, 1960, Chicago, Ill., 3-b.*

Atresia of Anus and Rectum

in a Pig

Leslie DOZSA, D.V.M.
N. O. OLSON, D.V.M.

IN APRIL, 1960, a Landrace-Berkshire-Tamworth pig, 3 weeks old and weighing 25 lb., was examined because of an abnormally distended abdomen and inability to defecate.

The pig had appeared normal until it was 3 weeks old. On close examination, the owner discovered that the pig had no anal opening. Although the skin did not protrude, the owner made an unsuccessful attempt to correct the congenital malformation (fig. 1). Even though the abdomen was markedly distended, the pig did not have signs of discomfort, and it continued to nurse.

On the basis of previous history and clinical examination, an exploratory laparotomy was performed to determine the extent of the abnormality and, if possible, to repair it surgically.

General anesthesia was induced by intraperitoneal administration of 2 gr. of pentobarbital sodium. A vertical incision was made in the left flank. When it was impossible to find the descending part of the colon and the rectum, this incision was extended horizontally toward the inguinal ring in the region of the kneefold. The incisions were approximately 3 inches long. The colon and cecum were distended with gas and were approximately 4 times normal size. The small intestine was empty and appeared normal. The serosa of the colon was slightly inflamed but the parietal peritoneum appeared normal.

The last and most dorsal turns of the transverse colon (colon descendens) ended



Fig. 1—Scar tissue of the unsuccessful incision in the anal region of the pig.

in front of the pelvis in a blind pouch which was attached by a short mesentery to the sublumbar region. About an

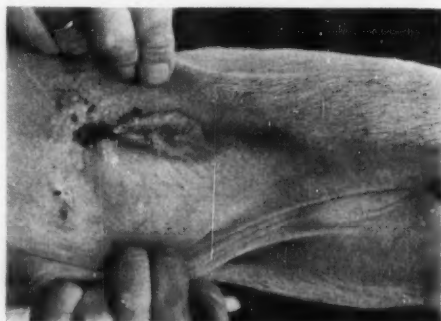


Fig. 2—Artificial anus in the flank of the pig, 3 weeks after the operation.

From the Department of Animal and Veterinary Science, West Virginia University, Morgantown.

Published with the approval of the director of the West Virginia Agricultural Experiment Station as scientific paper No. 636.

Fig. 3—Pig with the artificial anus (right) and his littermates (left).



inch of the transverse colon was drawn gently into the horizontal incision in the region of the kneefold and attached to the peritoneum and muscles by using interrupted sutures. The vertical part of the incision was then closed in 2 layers using No. 2 catgut for suturing the peritoneum and muscles and No. 4 braided silk for suturing the skin. The colon was opened and the lips of the incision were attached to the skin by using interrupted sutures (fig. 2).

When the colon was opened a considerable amount of gas escaped, but no fecal matter was present. The pig was placed in a small-animal, wire-floored cage with the intestinal opening down. After 3 hours, only a small amount of fecal matter had been passed, and the abdomen was still distended.

At this time, a paraffin oil enema was given and 0.5 mg. of a neostigmine preparation* (1:500) administered subcutaneously. In 20 minutes the pig discharged a considerable amount of pasty dark brown fecal matter. Five hours after the operation, the pig was still sluggish. Then, 5.0 per cent dextrose solution and 0.85 per cent sodium chloride solution were given subcutaneously, and another enema was given. The next morning the pig was alert and seemed hungry. Since there were bowel movements discharged through the artificial opening and the body temperature (taken in the artificial anus) was normal, the pig was sent home and placed with 6 littermates. No special medication or diet was given except 300,000 I.U. of penicillin in oil, injected intramuscularly, once daily for 2 days.

The pig made an uncomplicated recovery. According to the owner, it did not have any difficulties in defecating even after the litter was put on a solid diet and, although it weighed less than the littermates, it was lively and ate well (fig. 3).

Discussion

Although congenital malformations of the rectum and the anus are fairly common in all animals, arrested development of the colon which ends blindly in front of the pelvis at about the level of the flank is comparatively rare. In such cases, neither the rectum nor the anus is fully formed, there is no evidence of bowel contents beneath the skin in the anal region, and it is impossible to say how far forward the rectal cul-de-sac is situated.

Treatment must be prompt when there is no orifice for the escape of the fecal material, although exceptional cases have been recorded of young animals which have survived several weeks without passing feces. The surgical procedure varies according to the nature of the abnormality and must be directed toward restoring the passage of the fecal matter. This might be accomplished by: (1) the anal approach, or (2) the flank approach.

The first method starts with the removal of a disk of skin corresponding to the normal size of the anus. This is followed by dissection further forward until the ampulla of the rectum is found. After drawing it gently backward to the level of the skin, the rectum is opened and the cutaneous and mucous borders united with interrupted sutures. However, in some cases, the rectum can not be found, either because it is too far forward in the pelvis or because it is absent.

In such animals, it is necessary to perform a laparotomy in the flank, to bring the blind end of the bowel through the wound, to fix it to the borders of the latter, to open it, and to unite the edges of the skin and the mucous membranes by interrupted sutures.

Summary

A congenital anomaly in a pig, lack of anus and rectum, was corrected by performing a colostomy. The pig made an uncomplicated recovery.

*Stiglyn, Pitman-Moore Co., Indianapolis, Ind.

Perianal Fistulous Tracts

in a Dog

Albert SCHAFFER, B.S., D.V.M.
Irving R. BLOCK, B.A., M.D.

THE PORTION of a dog's rectum that extends caudad into the external sphincter muscle of the anus has never been adequately described for surgical considerations. This report is presented to further the understanding of the anatomy of this region and thereby facilitate removal of perianal fistulous tracts.

There is a columnar zone in the perianal region which contains mucosal pouches between columns of mucosa.³ This region is analogous to the crypts and pillars of Morgagne in man (fig. 1).

It has been stated that perianal fistulous tracts are prevalent in male German Shepherd Dogs and Irish Setters, and that the condition results from infection of the anal sacs complicated by abscessation. Then constipation causes the affected portion of the rectum to become devitalized.² On close examination, we discovered minute fecaliths that lodged in these crypts between the pillars. As a result, a localized pressure necrosis apparently developed in each crypt, predisposing the involved region to infection.

The infection progresses posteriorly through the deeper portions of the anal region, perigrinating throughout the region, and finally breaking through the tubular portion of the circumanal glands, resulting in a discharge of a viscid, offensive purulent material around the anus. This hypothesis was adopted after a surgical procedure was performed on a male Irish Setter, 9 years old.

From the College of Medicine, State University of New York, Brooklyn, where Dr. Schaffer is director, Central Animal Service, and Dr. Block is clinical instructor, Department of Surgery.



Fig. 1—Anus of dog. Pointer (left) indicates location of crypt; arrow (right) points to pillar. Both crypts and pillars are analogous to similar structures in man.

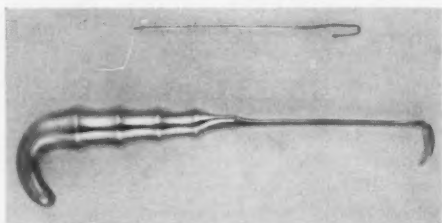


Fig. 2—Instruments for assisting surgical removal of perianal fistulous tracts in a dog are (above) 6-inch blunt pointed probe that is curved back on itself and (below) Sims vaginal speculum.

To surgically remove the perianal fistulous tracts, a modified Sims vaginal speculum, a strongly concave instrument (fig. 2), was used simultaneously as a speculum and as a retractor. By inserting it deep into the anus and by applying traction gently in one direction, an excellent view of the opposite deeper portion of the anal region adjacent to the rectum was possible, and the crypts and pillars were exposed.

An ordinary 6-inch probe with a small hook curved back on itself for about an inch was used to follow the course of these fistulas by inserting the hooked portion of this probe deeply into the crypts until the blunt end was visible. While applying light traction to the probe, each fistulous tract was then completely incised with a scalpel (fig. 3). The 2 loose mucosal flaps that result from the incision were grasped with a mouse-tooth thumb forceps and snipped off with scissors. This procedure was repeated on all the fistulous tracts present. The tracts were explored by probing to the exterior where they became confluent with the tubular portion of the circumanal glands. Suture material was not used; healing was allowed to progress naturally. The excised fistulas healed well without complications within 10 days.

Intramuscular injections of penicillin and streptomycin were given daily for 3 days. The dog was fed a low residue diet of cooked fine white cereal with milk, soft boiled eggs, and lean beef for 5 to 7 days. To curtail the dog's appetite for solid foods, corn syrup was added to his milk.

The patient had a slight tenesmus for 36 hours postoperatively. There was mild to moderate stricture of sphincter ani muscles in the involved area, as a result of the scar tissue formation following healing. A slight resistance was experienced by the surgeon as he attempted to insert his index finger into the anorectal area for examination. The resulting stricture did not, however, impair normal defecation in the patient for at least a year postoperatively.

By using a modified Sims vaginal speculum, this procedure was made relatively simple; the surgeon had an unobstructed view of the involved area, while his assistant was retracting the anal sphincter and until the entire area had been operated upon.

Although there are many reports of satisfactory results by veterinarians who excised only the superficial portions of these

tracts, recurrences have been frequent. Recurrence is probably due to the incomplete excision of all individual fistulous tracts



Fig. 3—Blunt end of hooked probe is shown inserted into a crypt. Another crypt is indicated by the pointer (right).

beyond the actual point of origin in the crypts.

Summary

- 1) Crypts and pillars exist in the perianal region of the dog, as they do in man.
- 2) The Sims vaginal speculum is an extremely useful instrument for performing anorectal surgery of the dog.
- 3) Incomplete excision to the actual site of origin of perianal fistulous tracts often results in recurrence of the fistulas.

References

- ¹Dorland, W. A. Newman: The American Illustrated Medical Dictionary. 22nd ed. W. B. Saunders Co., Philadelphia, Pa. (1951): 564-565.
- ²Lacroix, J. V., and Hoskins, H. Preston: Canine Surgery. 3rd ed. American Veterinary Publications, Inc., Evanston, Ill. (1952): 527-528.
- ³Miller, Malcolm E.: Guide to the Dissection of the Dog. 2nd ed. Ithaca, N.Y. (1949): 284.
- ⁴Thorek, Max: Modern Surgical Technic. Vol. 3. J. B. Lippincott Co., Philadelphia, Pa. (1944): 1524.

Leptospira Antibodies

in an Urban Canine Population

E. M. KRAVIS, D.V.M.
Daniel IVLER, PH.D.

SEROLOGIC EVIDENCE of *Leptospira* antibodies in canine serums has been observed by several workers.²⁻⁴ In the United States, *Leptospira pomona* has been reported as the predominant type of antibody in cattle and swine.¹ Because of epidemiologic considerations, incidence of antibodies to *Leptospira* species in the canine population of Syracuse, N.Y., was determined. This is an area where dairy cattle are the predominant agricultural animals and where canine and human infection may occur by the cow-to-dog-to-man transmission cycle.

Materials and Methods

Seventy blood samples were collected from the cephalic veins of canine boarders and patients from 3 veterinary hospitals and the A.S.P.C.A. kennel in Syracuse. In respect to breed, sex, and age, dogs were selected at random. It was assumed that the demonstration of antibodies would be indicative of an actively acquired immunity, a symptomless carrier state, or both. All but 1 of the dogs (sample 26) were apparently healthy at the time blood was obtained.

The serum obtained from each blood specimen was either tested immediately or frozen at -20 C. until assayed for antibodies. Each sample was screened for the presence of antibodies by the macroscopic slide agglutination procedure,⁴ using com-

mercially available pooled antigens.* Serums that reacted positively to the pooled antigens were further assayed by titration against the component single antigens used in each pool.

Sample 26 was obtained from a Cocker Spaniel which had a temperature of 99.9 F., ocular discharge, anorexia, emesis, and

TABLE 1—Positive Reactions to Pooled Antigens*

	Samples tested	Positive reactions	No. false positive reactions**	True positive reactions (%)
Pool 1	70	16	4	17.1
Pool 2	70	15	11	5.7
Pool 3	70	21	8	18.6
Total	70	52	23	41.4

*Pool 1: *L. ballum*, *L. canicola*, and *L. icterohaemorrhagiae* antigens pooled; Pool 2: *L. bataviae*, *L. grippityphosa*, and *L. pyrogenes* antigens pooled; Pool 3: *L. autumnalis*, *L. pomona*, and *L. sejiroae* antigens pooled.

**Agglutination with pools but not with individual antigens of pool.

intermittent clonic spasms of head and neck muscles. Shortly after the first blood sample was obtained, the dog was euthanatized, and no further titer determinations could be made.

Multiple samples were obtained over a 5-month period from a 4-year-old female Boxer in apparently good health. This dog had a clinical history indicating a possible leptospiral infection at the age of 1 year (sample 117).

Results

Of the 70 dog serums tested, 41.4 per cent reacted positively to at least 1 lepto-

From the State University of New York, Upstate Medical Center, Syracuse.

This investigation was supported by a PHS research grant, E-2660, from the National Institute of Allergy and Infectious Diseases, Public Health Service.

The authors thank Drs. R. Fuess, H. Helsel, W. Matuzak, R. Stack, and W. Stack of Syracuse, N.Y., the A.S.P.C.A. office for supplying the serums used in this study, and Miss L. Love and Mrs. L. Blimet for technical assistance.

*Difco Laboratories, Detroit, Mich.

TABLE 2—Positive Reactions to Individual Antigens of Pools 1, 2, and 3

Antigen	Samples tested	Positive reactions	Positive (%)
<i>L. ballum</i>	70	4	5.7
<i>L. canicola</i>	70	6	8.6
<i>L. icterohaemorrhagiae</i>	70	11	15.7
<i>L. bataviae</i>	70	2	2.9
<i>L. grippotyphosa</i>	69	1	1.5
<i>L. pyrogenes</i>	69	3	4.4
<i>L. autumnalis</i>	69	3	4.4
<i>L. pomona</i>	70	12	17.2
<i>L. sejroe</i>	66	1	1.5

spiral antigen (table 1). This percentage of positive reactions agrees closely with a recent report of the incidence of leptospiral antibodies in the serums of dogs from the Chicago area.³

In contrast to the Chicago study, where the predominating reactions were to *Leptospira icterohaemorrhagiae*, we have found a significant number of reactions to *L. pomona* as well as to *L. icterohaemorrhagiae*. Positive reactions to these antigens occurred to the extent of 17.2 and 15.7 per cent, respectively (table 2).

Sample 26, obtained from the Cocker Spaniel with clinical signs suggestive of a leptospiral infection, reacted positively to *L. pomona* and *L. icterohaemorrhagiae* with titers of 1:512 to both antigens. Attempts to isolate leptospires were unsuccessful.

Serums from the healthy female Boxer, obtained at 112 and 148 days following the initial sample, retained a titer of 1:64 to *Leptospira canicola* (only positive reaction obtained). Although the history of this dog and the constant titer of antibodies to *L. canicola* are suggestive of a carrier or a

persistent, active immunity, it could not be determined whether the carrier state or active immunity state was present here.

Discussion

Leptospira pomona has been isolated from the urine of 2 dogs living in close association with cattle.⁶ In these studies, 4 other dogs also were shown to have serologic evidence of *L. pomona* infection. The results found in the present survey support the conclusions of these workers that *L. pomona* is transmitted from cattle to dogs. In addition, it appears that this organism may be transmitted from dog to dog, readily inducing significant antibody titers in an urban canine population contiguous with dairy cattle areas.

The transmission, therefore, from cattle to dogs and, possibly, to man may be a real one. Of prime importance is the concept that not only *L. canicola* and *L. icterohaemorrhagiae* are to be considered for definitive diagnosis in man and dog, but also *L. pomona*.

Although the macroscopic slide agglutination test is simple and effective for general screening procedures, the incidence of cross reactivity is high enough to make specific species identification too involved for routine use, particularly without serial samples.

Of the 70 serums tested, 5 reacted positively to *L. icterohaemorrhagiae* alone (7.1%) and 8 reacted positively to *L. pomona* alone (12.6%) (table 3). These single reacting systems accounted for 44.8 per cent of all positive reactions. Five serums reacted positively to 2 antigens, 4 serums reacted positively to 3 antigens. One serum sample reacted positively to all 9 antigens in titers ranging from 1:32 to 1:512 (sample 26 obtained from the Cocker Spaniel had clinical signs suggestive of *Leptospira* infection).

Summary

A serologic survey of the incidence of canine leptospiral antibodies in Syracuse, N.Y., was carried out using the macroscopic slide agglutination test described by Galton. Of the serums tested, 41.4 per cent reacted positively to 1 or more of 12 *Leptospira* antigens.

TABLE 3—Number of Serums that Reacted Positively to 1 or More *Leptospira* Antigens

Antigens reacting	No. of serums
1. <i>L. pomona</i>	8
2. <i>L. icterohaemorrhagiae</i>	5
3. <i>L. icterohaemorrhagiae</i> , <i>L. canicola</i>	2
4. <i>L. canicola</i> , <i>L. ballum</i>	1
5. <i>L. pyrogenes</i> , <i>L. autumnalis</i>	1
6. <i>L. pyrogenes</i> , <i>L. pomona</i>	1
7. <i>L. icterohaemorrhagiae</i> , <i>L. canicola</i> , <i>L. ballum</i>	2
8. <i>L. icterohaemorrhagiae</i> , <i>L. canicola</i> , <i>L. pomona</i>	1
9. <i>L. bataviae</i> , <i>L. autumnalis</i> , <i>L. pomona</i>	1
10. All nine antigens	1

References

- ¹Alexander, A. D., Gluser, C. A., Maluats, P., and Koder, H.: Observations on the Prevalence of Leptospirosis in Canine Populations of the United States. *Am. J. Hyg.*, 65, (1957): 43-56.
- ²Alston, J. M., and Broom, J. C.: *Leptospirosis in Man and Animals*. E. & S. Livingstone Ltd., London, 1958.
- ³Dolowy, W. C., and Reich, C. V.: Serologic Survey of 659 Dogs for Leptospirosis Using the Capillary Tube Method. *J.A.V.M.A.*, 135, (Nov. 1, 1959): 486-587.
- ⁴Galton, Mildred M., Powers, Dorothy K., Hall, Anna D., and Cornell, Richard G.: A Rapid Macroscopic Slide Screening Test for the Serodiagnosis of Leptospirosis. *Am. J. Vet. Res.*, 19, (April, 1958): 505-512.
- ⁵McIntyre, W. I. M., and Montgomery, G. L.: Renal Lesions in *Leptospira canicola* Infections in Dogs. *J. Path. and Bact.*, 64, (1952): 145-160.
- ⁶Morter, R. L., Ray, J. A., and Chapel, D. F.: *Leptospira pomona* Isolation from Naturally Occurring Canine Infections, *J.A.V.M.A.*, 135, (Dec. 1, 1959): 570-571.

Malathion for Mange in Cats

The successful treatment of cats with notoedric mange, by immersion in a 0.25 to 1.25 per cent aqueous suspension of malathion, has been reported. A commercial wettable powder was employed and, in all but the initial 2 cases, each cat was immersed twice at intervals of 7 to 8 days. A suspension containing 0.5 per cent malathion was most frequently used.

Toxicity trials were carried out using the commercial wettable powder and, in addition, a commercial emulsion concentrate. Signs of toxicosis appeared in 1 of 4 cats immersed in an 8 per cent suspension of malathion and in both of 2 cats immersed in a 4 per cent emulsion.—*Austral. Vet. J.*, 36, (March, 1960): 85.

Antiestrus Drug

As an oral antiestrus drug, hydroxprogesterone acetate is indicated in the following situations: (1) when short-term delay of estrus is desired in hunting, show, derby trial, traveling, companion, or house bitches; (2) when long-term delay of estrus is desired in house bitches or kennelled bitches; (3) when delay of estrus is desirable or required, to allow litter-spacing; (4) when delay of estrus is medically indicated, as in bitches with tendencies toward frequent estrus, prolonged estrus, or both; and in bitches with multiple "estrogenized" mammary tumors, in which ovariectomy is contraindicated; (5) when delay of estrus is medically indicated because pregnancy, parturition, or both are contraindicated, as in bitches with hernias, pelvic obstruction, and uterine atony.

The drug is more effective in preventing estrus than in terminating it once signs have appeared. Administration is on a milligram per pound basis. When administration is stopped, bitches return to normal cycling after a variable period, apparently dependent on the pituitary's escape from antigenadotropic effect. Litters are normal in every respect.—K. B. Haas, D.V.M., *Annual Meeting of the Maryland State Veterinary Medical Association, Ocean City, Md., June 23, 1960.*

Neoplasms of Dogs

J. P. THRASHER, D.V.M.

DURING THE 4-YEARS, 1956 through 1959, 145 neoplasms were found in 127 privately owned dogs treated at our hospital. Similar reports of this type reviewed in the literature^{1-3, 5-7} were made by investigators in teaching and research institutions. It is hoped that this report will stimulate veterinarians in practice to avail themselves of the services of pathologists and encourage them to publish their findings.

Materials and Methods

The neoplasms reported were obtained from 102 dogs at surgery and 27 at necropsy. The tissues were preserved and fixed in 10 per cent formalin immediately after removal and forwarded to a pathologist.*

The pathologist trimmed and selected his tissues from the gross specimens and again fixed the tissues in 10 per cent formalin. The selected tissues were then processed in the routine paraffin-embedding procedure and cut into sections 5 to 7 μ thick. The tissues were stained with hematoxylin and eosin or special stains as selected by the pathologist for a more definitive diagnosis. A gross and histopathologic description, with the diagnosis, was reported by letter to this office.

Results

The appropriate data are presented (table 1). The number of neoplasms from each organ is shown by the figure following the organ's name.

Dr. Thrasher is a general practitioner in New Orleans, La.

*Six laboratories in New Orleans were used for the histopathologic diagnoses of the neoplasms. Drs. E. H. Lawson and S. R. Staggars diagnosed 80 cases; Dr. Henry Piot, Tulane University School of Medicine, 41 cases; Drs. W. H. Harris, A. V. Friedrichs, and W. H. Harris, Jr., 9 cases; and Drs. A. Y. K. Hew and R. M. Hartwell, the U. S. Marine Hospital and Touro Infirmary, 1 case each.

The general classification used in the tabulation is that of Smith and Jones.¹⁰ The specific name and descriptive terminology of the neoplasm is given, as are breed, sex, and age of the dog. Only primary neoplasms are considered, and metastatic lesions are not included.

Discussion

The results are presented in this form (table 1) to show the correlation between the neoplasm and breed, sex, and age of the affected dog. This is not shown in the similar studies which have been reviewed.

These neoplasms were not selected but represent the total studied during the 4 years. Of the 145 neoplasms studied, 75 were benign and 70 were malignant. The skin and adnexa accounted for 42 of the benign tumors. Thus, these data would suggest that approximately 3 out of 4, or 75 per cent, of the neoplasms found in dogs are malignant if the skin neoplasms are disregarded.

The malignant and benign neoplasms are about equal in distribution in the mammary glands and testes. Only 10 of the 34 mammary gland neoplasms occurred in dogs under 10 years of age. Also, only 5 of 13 neoplasms of the testes were found in dogs under 10 years of age. Age must be considered as a predisposing factor in these neoplasms.

The fourth greatest number of neoplasms occurred in the hemic and lymphoid tissues group. Although only 9 neoplasms were found, they were all malignant. All cases studied terminated rapidly. In 2 dogs, Hodgkin's-type lymphoma were identified on the basis of the presence of Sternberg-Reed cells.⁴ Several pathologists were consulted on these particular cases for definitive confirmation of the diagnosis.

The lungs were fifth in this correlation of sites and the number of tumors found. Of the 7 neoplasms in the lungs, 6 were

TABLE 1—Record of 145 Neoplasms from 127 Dogs

Location, No., and kind of neoplasm	Breed	Sex*	Age yrs.
SKIN—51 (including adnexa, subcutis, and adjoining tissue)			
Squamous cell carcinoma	Cocker Spaniel		
Basal cell carcinoma	Mixed	M	11
Sebaceous gland carcinoma	Boston Terrier	M	6
Sebaceous adenoma	Cocker Spaniel	F	14
Sebaceous adenoma	Boston Terrier	F	?
Sebaceous adenoma	Mixed	M	7
Sebaceous adenoma	Scottish Terrier	M	9
Sebaceous adenoma	Mixed	M	10
Sebaceous adenoma	Mixed	M	12
Sebaceous adenoma	Cocker Spaniel	M	12
Sebaceous adenoma	Cocker Spaniel	F	13
Syringocystadenoma	Irish Terrier	F	17
Syringocystadenoma	Poodle	M	?
Sweat gland adenoma	Pug	F	5
Sweat gland adenoma	Mixed	M	10
Perianal adenoma	Cocker Spaniel	M	11
Verruca (papilloma)	Irish Setter	M	10
Verruca (papilloma)	Poodle	M	?
Verruca (papilloma)	Labrador Retriever	M	4
Leukemia cutis	Boxer	F	5
Granulocytic leukemia	Cocker Spaniel	SF	7
Undifferentiated sarcoma	Mixed	M	10 mo.
Dermatofibrosarcoma	Mixed	M	?
Dermatofibrosarcoma	Boxer	F	?
Dermatofibroma	Boston Terrier	M	7
Dermatofibroma	Weimaraner	F	14
Fibroma	Boxer	F	6
Fibroma	Cocker Spaniel	F	8
Lipoma	Weimaraner	M	9
Lipoma	Cocker Spaniel	F	6
Lipoma	Mixed	M	10
Hemangioma (capillary)	Boxer	M	13
Hemangioma (capillary)	Boxer	SF	7
Hemangioma (cavernous)	Mixed	M	10
Melanoma (malignant)	Doberman Pinscher	F	10
Melanoma (benign)	Doberman Pinscher	M	7
Melanoma (benign)	Mixed	M	8
Mast cell tumor	Cocker Spaniel	M	17
Mast cell tumor	Poodle	M	4 mo.
Mast cell tumor	Rhodesian Ridgeback	F	11 mo.
Mast cell tumor	Boxer	M	3
Mast cell tumor	Boxer	SF	4
Mast cell tumor	Boxer	SF	4
Mast cell tumor	Boxer	M	7
Mast cell tumor	Boxer	F	8
Mast cell tumor	Boxer	F	8
Mast cell tumor	Mixed	M	8
Mast cell tumor	Boston Terrier	F	10
Mast cell tumor	Boxer	F	10
Mast cell tumor	Mixed	SF	11
Mast cell tumor	Mixed	M	12
MOUTH—6 (lips, gums, pharynx, salivary glands)			
Melanoma (malignant)	Scottish Terrier	M	10
Melanoma (malignant)	Mixed	F	11
Melanoma (malignant)	Cocker Spaniel	F	14
Melanoma (malignant)	English Setter	M	16
Neurofibroma	Great Dane	M	7 mo.
Hemangioma (capillary)	Boxer	M	6
ESOPHAGUS—3			
Osteogenic sarcoma	Hound	F	4
Osteogenic sarcoma	Hound	F	5
Osteogenic sarcoma	Pointer	F	8
STOMACH—1			
Leiomyosarcoma	German Short-Haired Pointer	M	12
LIVER—1			
Sarcoma	German Shepherd Dog	M	13
PANCREAS—4			
Adenocarcinoma	Unidentified	?	?
Islet cell adenocarcinoma	Wired-Haired Fox Terrier	M	4
Islet cell tumor	Mixed	F	12
Adenoma	German Shepherd Dog	M	13
LUNGS—7			
Squamous cell carcinoma (bronchogenic)	Doberman Pinscher	F	9
Carcinoma (bronchiolar)	German Shepherd Dog	M	9
Carcinoma (bronchiolar)	Mixed	M	11
Carcinoma (bronchiolar)	Dachshund	M	14
Adenocarcinoma	Doberman Pinscher	M	10
Adenocarcinoma (bronchiolar)	Doberman Pinscher	M	10
Hematoma	Wired-Haired Fox Terrier	M	10
HEART—1			
Myxoma (valve)	Boston Terrier	F	14

*SF—sterile female.

TABLE 1 (continued)—Record of 145 Neoplasms from 127 Dogs

Location, No., and kind of neoplasm	Breed	Sex*	Age yrs.
KIDNEY—1			
Renal cell carcinoma	Cocker Spaniel	M	12
MAMMARY GLAND—34	Dachshund	F	13
Basal cell carcinoma	Doberman Pinscher	F	7
Lipoma	Brittany Spaniel	F	6
Fibroadenoma	Cocker Spaniel	F	10
Adenofibromata	Dachshund	SF	9
Osteoma	Cocker Spaniel	F	11
Carcinoma (ductile)	Cocker Spaniel	F	12
Carcinoma (ductile)	Cocker Spaniel	F	12
Carcinoma (ductile)	Mixed	F	13
Carcinoma (ductile)	Cocker Spaniel	F	8
Carcinoma (infiltrative)	Mixed	F	8
Carcinoma (lobular)	Cocker Spaniel	F	9
Carcinoma (lobular)	Doberman Pinscher	F	9
Carcinoma (papillary)	Mixed	F	14
Carcinoma (undifferentiated)	Cocker Spaniel	F	7
Adenocarcinoma	Pug	F	9
Adenocarcinoma	Cocker Spaniel	F	10
Adenocarcinoma (papillary)	Cocker Spaniel	F	11
Adenocarcinoma (papillary)	Cocker Spaniel	F	16
Adenocarcinoma	Boston Terrier	F	8
Cystadenocarcinoma	Cocker Spaniel	F	12
Teratoid mixed tumor	Mixed	F	6
Mixed tumor (benign)	Pointer	F	6
Mixed tumor (benign)	Poodle	F	7
Mixed tumor (benign)	Pointer	F	8
Mixed tumor (benign)	Yorkshire Terrier	F	9
Mixed tumor (benign)	Mixed	F	11
Mixed tumor (benign)	Cocker Spaniel	F	12
Mixed tumor (benign)	Cocker Spaniel	F	12
Mixed tumor (benign)	Mixed	F	12
Mixed tumor (benign)	Mixed	F	15
Mixed tumor (benign)	Dachshund	F	10
Mixed tumor (malignant)	Mixed	F	12
Mixed tumor (malignant)	Chow Chow	F	13
Mixed tumor (malignant)			
VAGINA—2	Mixed	F	?
Reticulum cell sarcoma	Mixed	F	11
Lymphosarcoma			
UTERUS—1	German Shepherd Dog	F	12
Leiomyoma			
TESTIS—13	Wire-Haired Fox Terrier	M	12
Seminoma	Chihuahua	M	4
Sertoli cell tumor (undescended)	Dachshund	M	10
Sertoli cell tumor (undescended)	Cocker Spaniel	M	10
Sertoli cell tumor (undescended)	Mixed	M	12
Sertoli cell tumor (undescended)	Wire-Haired Fox Terrier	M	12
Sertoli cell tumor (undescended)	Boxer	M	14
Sertoli cell tumor (undescended)	Weimaraner	M	6
Embryonal carcinoma (undescended)	Boxer	M	7
Embryonal carcinoma (undescended)	Great Dane	M	7
Embryonal carcinoma	Boxer	M	8
Embryonal carcinoma (undescended)	Wire-Haired Fox Terrier	M	12
Embryonal carcinoma	Wire-Haired Fox Terrier	M	12
Embryonal carcinoma			
PROSTATE—1	Dachshund	M	4
Adenocarcinoma			
PENIS, PREPUCE—1	Mixed	M	14
Squamous cell carcinoma (prepuce)			
MUSCULO-SKELETAL TISSUE—4	Boxer	F	7
Osteogenic sarcoma (humerus)	Doberman Pinscher	F	9
Osteogenic sarcoma (radius)	Irish Wolf Hound	M	7
Leiomyosarcoma	Pug	F	8
Leiomyoma (perineal region)			
THYROID—2	Great Dane	?	6
Small cell carcinoma	Boxer	F	11
Follicular carcinoma			
HEMIC AND LYMPHOID TISSUE—9	Pointer	M	7
Lymphoma (Hodgkin's type)	Mixed	M	8
Lymphoma (Hodgkin's type)	Mixed	F	5
Malignant lymphoma	Boxer	F	8
Malignant lymphoma	Boxer	SF	9
Malignant lymphoma	Boston Terrier	M	10
Malignant lymphoma	Mixed	SF	11
Malignant lymphoma	Mixed	F	18
Malignant lymphoma	Boxer	SF	7
Reticulum cell sarcoma			
SPLEEN—2	Mixed	F	13
Hematoma	Cocker Spaniel	F	11
Fibrosarcoma			
NERVOUS TISSUE—1			
Neurilemmoma	Cocker Spaniel	M	11

malignant. In man, cigarette smoking is thought to be a contributing factor in lung malignancies. When one considers that these 6 neoplasms represent 9 per cent of the total number of malignancies studied in this report, it may be wise to consider air pollution or geographic location as an inciting cause of lung cancer. Certainly, this particular site of neoplasms in dogs should be studied further.

Three of the most interesting neoplasms studied were the osteogenic sarcomas of the esophagus. The characteristic clinical signs of hypertrophic pulmonary osteoarthropathy were found in the long bones of 2 dogs. Metastases to the lungs were found in all dogs with this type of neoplasm. The nematode, *Spirocerca lupi*, has been reported as the causative agent of this particular neoplasm.⁸ Radiographic studies of the chest revealed the typical deformative ossifying spondylitis on the bodies of the thoracic vertebrae dorsal to the neoplasm.⁹ A comparative study of these 3 neoplasms with the literature reviewed would lead one to conclude that these 3 neoplasms were associated with *Spirocerca lupi* infection.

It is not possible to calculate the incidence of neoplasms in dogs as reported here since the number of individual dogs examined was not available. Furthermore, due to a reluctance of many owners to pay for a histopathologic diagnosis, many tissues were discarded. Finally, a majority of owners did not permit a necropsy of their pet dog. Some of the most interesting neoplasms were found on routine necropsy.

The majority of neoplasms were found in dogs 6 to 13 years of age. Of the 145 neoplasms found, 89 occurred in this age group. This compares favorably with the findings of another investigator⁷ who examined 809 neoplasms, 583 of which were in dogs 7 through 14 years of age.

Summary

A total of 145 neoplasms were found in privately owned dogs. Seventy-five of these

neoplasms were benign and 70 were malignant. These neoplasms were found in 127 dogs, 110 dogs with 1 tumor, 16 dogs with 2 tumors, and 1 dog with 3 tumors. The sex distribution was nearly equal: 58 males, 57 females, 10 spayed females, and 2 of unrecorded sex. In breed distribution, 28 were of mixed breeding, 25 were Cocker Spaniels, 19 were Boxers, and the remaining 55 dogs were distributed among 24 other breeds.

There was a high number of primary neoplasms of the lungs. This group represented 9 per cent of the total malignancies studied.

Three osteogenic sarcomas of the esophagus were found. These neoplasms are believed to be associated with *Spirocerca lupi* infection.

A direct correlation of the neoplasm with the breed, sex, and age is presented in the table.

References

- ¹Cotchen, E.: Neoplasms in Small Animals. Vet. Rec., 63, (1951): 56-72.
- ²Cotchen, E.: Further Observation on Neoplasms in Dogs, with Particular Reference to Site of Origin and Malignancy. Brit. Vet. J., 110, (1954): 218-232.
- ³Jackson, C.: Incidence and Pathology of Tumors of Domesticated Animals in South Africa. Onderstepoort J. Vet. Science, 6, (1936): 3-460.
- ⁴Moulton, J. E., and Bostick, W. L.: Canine Malignant Lymphoma, Simulating Hodgkin's Disease in Man. J.A.V.M.A., 132, (March 1, 1958): 204-209.
- ⁵Mulligan, R. M.: Statistical and Histologic Study of 120 Canine Neoplasms. Arch. Path., 45, (1948): 216-228.
- ⁶Mulligan, R. M.: Neoplastic Diseases of Dogs: Mast Cell Sarcoma, Lymphosarcoma, Histiocytoma. Arch. Path., 46, (1948): 477-492.
- ⁷Mulligan, R. M.: Neoplasms of the Dog. Williams & Wilkins Co., Baltimore, Md., 1949.
- ⁸Ribelin, W. E., and Bailey, W. S.: Esophageal Sarcomas Associated with *Spirocerca lupi*. Cancer, 11, (1958): 1242-1246.
- ⁹Seibold, H. R., Bailey, W. S., Hoerlein, B. F., Jordan, E. M., and Schwabe, C. W.: Observations on the Possible Relation of Malignant Esophageal Tumors and *Spirocerca lupi* Lesions in the Dog. Am. J. Vet. Res., 16, (Jan., 1955): 5-14.
- ¹⁰Smith, H. A., and Jones, T. C.: Veterinary Pathology. Lea & Febiger, Philadelphia, Pa., 1957.

Screwworms Discovered on Racing Dog in Florida

Screwworms were found by a Tampa, Fla., veterinarian in a cut on the shoulder of a racing Greyhound that had been transported to Tampa from Kansas. Identification of the parasite was made Oct. 25, 1960, at Sebring, Fla., headquarters for the 1958-1959 Screwworm Eradication Program. The last case in Florida was reported June 17, 1959.—USDA Release, Oct. 27, 1960.

Portosystemic Communications

in Animals with Hepatic Cirrhosis and Malignant Lymphoma

Arturs VITUMS, DR. MED. VET.

IN HUMAN MEDICINE, it is well-known that pathologic intrahepatic or extrahepatic obstruction of the portal blood flow often results in the development of a collateral circulation by way of portosystemic communications. Although similar collateral circulation could possibly be expected in domestic animals, no reports were found in the literature.

Collateral circulation by way of portosystemic communications has been provoked in experimental animals (dogs, cats, rabbits, monkeys) in which the portal vein was gradually constricted by a ligature,^{1-7, 9-10, 18-22, 24, 25} or occluded by serial intravenous injections of a solution of fine particles of ground quartz^{17, 26} or by repeated exposures to carbon tetrachloride.⁸

The portal vein in normal dogs was studied,²³ and the portosystemic communications in normal dogs were compared with those communications induced in experimental dogs by gradual constriction of the portal vein.^{22, 24}

From these studies, the gradual constriction of the trunk of the portal vein was usually found to be followed in about 1 to 2 months by a marked dilatation of normally existing small communications between the portal system and the systemic veins.

Two major groups of portosystemic communications were distinguished—the portoprecaval and the portopostcaval.

The portoprecaval communications were represented by cardioesophageal anastomoses. These anastomoses were observed between the cardinal radicles of the left gastric vein and the esophageal radicles of the azygos vein.

The portopostcaval anastomoses comprised the most extensive group of porto-

systemic communications. The gastrophrenic, duodenal, velar omental, left colic, and rectal anastomoses have been described in this group.^{22, 24}

In this report, collateral circulation by way of portosystemic communications is reported in domestic animals with pathologic conditions.

Material and Methods

Two canine and 1 feline cadavers served as material for observations reported in this paper. One dog was a Terrier bitch, 10 to 12 years old, with a diagnosis of hepatic cirrhosis. The other dog was a male of mixed breeding, about 10 years old, with a diagnosis of malignant lymphoma. No previous history was available on either dog. The cat was a male about 11 years old that had been ill for several months. Ascitic fluid was tapped from the peritoneal cavity a few days before the cat died. The diagnosis

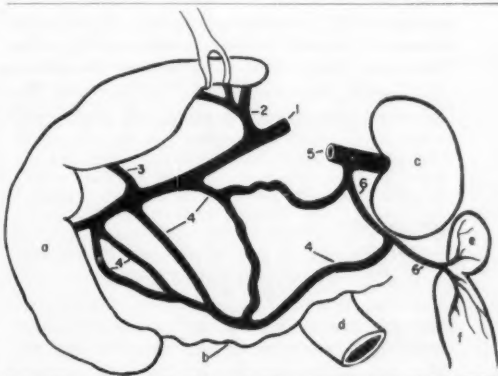


Fig. 1—Portosystemic communications in a Terrier bitch with hepatic cirrhosis (tracing from a photograph): a—spleen, b—edge of the velar omentum, c—left kidney, d—descending colon, e—left ovary, f—left uterine horn, 1—splenic vein, 2—its dorsal radicle, 3—its ventral radicle, 4—velar omental anastomoses, 5—left renal vein, and 6—left gonadal vein.

Dr. Vitums is professor of veterinary anatomy in the Department of Veterinary Anatomy, College of Veterinary Medicine, Washington State University, Pullman.

was hepatic cirrhosis. The portal system of each dog was injected with latex by way of a jejunal vein. The portal system of the cat was not suitable for injection. The animals were preserved in 10 per cent formalin solution for further examination.

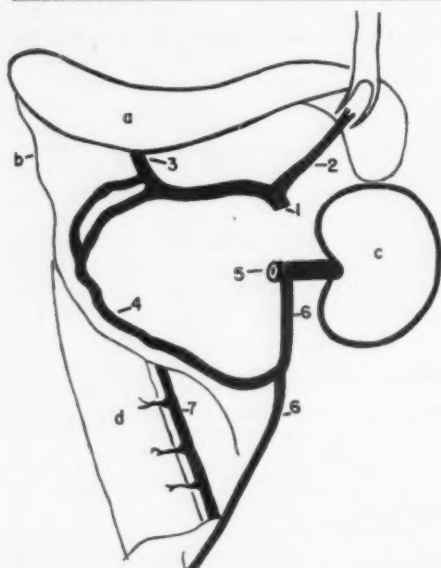


Fig. 2—Portosystemic communications in a male dog with malignant lymphoma (tracing from a photograph): a—spleen, b—edge of the velar omentum, c—left kidney, d—descending colon, 1—splenic vein, 2—its dorsal article, 3—its ventral radicle, 4—velar omental anastomoses, 5—left renal vein, 6—left gonadal vein, and 7—left colic vein.

Observations

1) *Observations in the Dogs.*—Both dogs had a marked dilatation of the splenic and the left gonadal* veins. The communications between the distinctly enlarged velar omental** radicles of the splenic vein and the mesocolic radicles of the left gonadal vein were demonstrated by latex injections (fig. 1 and 2).

*The term "gonadal vein" used in this report is synonymous with the term "internal spermatic vein" in male and "utero-ovarian vein" in female.

**The velar omentum is a fold of the greater omentum.²³

The cardioesophageal anastomoses were only slightly distended in both dogs. The gastrophrenic, duodenal, left colic, and rectal anastomoses were not particularly dilated in these dogs.

In the dog with malignant lymphoma, the major tributaries of the portal vein, the common mesenteric and gastrosplenic veins, were partly compressed by the enlarged cranial mesenteric lymph nodes. The largest of these nodes measured 6 by 4 cm.

2) *Observations in the Cat.*—The porto-postcaval anastomoses of the cat, except the rectal anastomoses, were markedly dilated.

Gastrophrenic anastomoses between the gastrosplenic and left phrenoabdominal veins formed an extensive plexus of tortuous vessels around the celiac and cranial mesenteric arteries and associated sympathetic ganglia and plexuses (fig. 3, 10).

Duodenal anastomoses were observed between the mesenteric radicles of the caudal pancreatoduodenal vein and the radicles of the left phrenoabdominal vein, the right gonadal vein, and the capsular radicles of the left renal vein (fig. 3, 12).

The velar omental radicles of the splenic vein communicated mainly with the mesocolic radicles of the right gonadal vein which, in this case, was a tributary of the right renal vein. Some smaller velar omental radicles also anastomosed with the capsular radicles of the right and left renal veins (fig. 3, 5).

Most of the left colic anastomoses joined the right gonadal vein. Some of them entered the left gonadal vein which was a direct tributary of the postcava (fig. 3, 21).

The cardioesophageal anastomoses were only slightly distended and the rectal anastomoses had no distinct dilatation.

A small vein emerged from the caudate process of the caudate lobe of the liver. This vein coursed in the hepatorenal fold and anastomosed with a capsular radicle of the right renal vein. Another small vein coursed in the falciform ligament toward the xiphoid region. A possible communication of this vein with the radicles of the cranial or caudal epigastric veins could not be determined because the ventral abdominal wall of this cat had been removed.

Enlargement of the spleen, the most frequent accompaniment of a chronic obstruction of the portal blood flow, was not observed in these 3 animals.

Discussion

Hepatic cirrhosis is a lesion which most commonly leads to the intrahepatic obstruction of the blood flow through the liver. The portal blood is forced to by-pass the liver, utilizing the portosystemic communications. These collateral pathways are small, insignificant vessels under normal conditions;²⁴ however, following portal obstruction, they may undergo enormous dilatation and assume great importance.

Similar conditions are observed in extrahepatic obstruction of the portal blood flow to the liver. Thrombosis of the portal vein (suppurative portophlebitis) or a pressure from outside the vein by abnormally enlarged portal or mesenteric lymph nodes, or by malignant tumors of the stomach or pancreas, may cause such an obstruction. In the case of the extrahepatic occlusion of the trunk of the portal vein or its major tributaries, part of the portal blood may still reach the liver by way of extensive anastomoses among the radicles of the portal vein. Part of the portal blood, however, is shunted into the portosystemic communications which, in time, become markedly distended.

The dilatation of the portosystemic communications reported herein apparently were caused by the intrahepatic obstruction of the portal blood flow in the dog and cat with hepatic cirrhosis and by the extrahepatic compression of the major tributaries of the portal vein by the enlarged cranial mesenteric lymph nodes in the dog with malignant lymphoma.

The portosystemic communications observed in these animals were basically similar to those portosystemic communications induced experimentally by the gradual constriction of the trunk of the portal vein.^{22, 24}

Absence of the splenomegaly in these animals may be explained by the well-developed velar omental anastomoses by way of which the venous blood from the spleen was drained into the systemic veins.

Collateral circulation by way of the portosystemic communications might also be expected in other species of the domestic animals as a result of pathologic intrahepatic or extrahepatic obstruction of the portal blood flow. More reports on this subject may provide valuable information for the study of portal hypertension in the domestic animals.

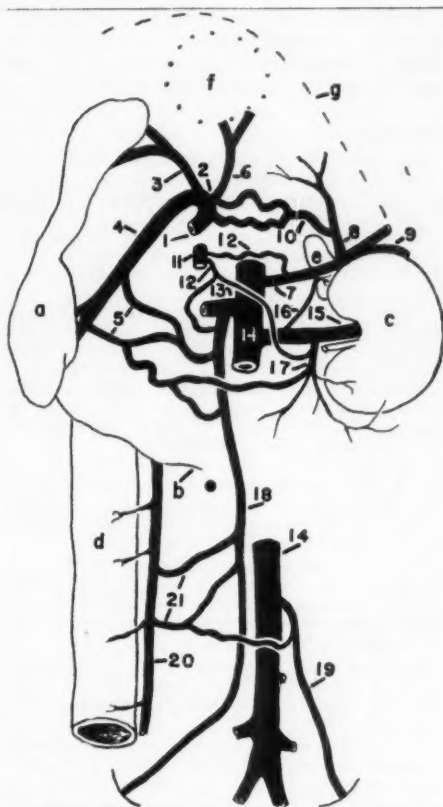


Fig. 3—Diagram of the portosystemic communications in a male cat with hepatic cirrhosis: a—spleen, b—edge of the velar omentum, c—left kidney, d—descending colon, e—left adrenal gland, f—fundus of the stomach (position indicated by a dotted line), g—diaphragm (position indicated by an interrupted line), 1—gastro-splenic vein, 2—splenic vein, 3—dorsal radicle, 4—its ventral radicle, 5—velar omental anastomoses, 6—left gastric vein, 7—left phrenic abdominal vein, 8—left phrenic vein, 9—left abdominal vein, 10—gastrophrenic anastomoses, 11—caudal pancreaticoduodenal vein, 12—duodenal anastomoses, 13—right renal vein, 14—postcava, 15—left renal vein, 16—left adrenal vein, 17—capsular radicle of the left renal vein, 18—right gonadal vein, 19—left gonadal vein, 20—left colic vein, and 21—left colic anastomoses.

Summary

Portosystemic communications were markedly enlarged in a dog and a cat with hepatic cirrhosis and in a dog with malignant lymphoma. A basic similarity was observed between the portosystemic commu-

nications in these animals and those porto-systemic communications induced by a gradual constriction of the trunk of the portal vein in experimental animals.

References

- ¹Baronofsky, I. D., and Wagensteen, O. H.: Obstruction of Splenic Vein Increases Weight of Stomach and Predisposes to Erosion or Ulcer. *Proc. Soc. Exptl. Biol.*, 59, (1945): 234-238.
- ²Brunschwig, A., Bigelow, R., and Nichols, S.: Elective Occlusion and Excision of the Portal Vein. An Experimental Study. *Surgery*, 17, (1945): 781-785.
- ³Child, C. G., Milnes, R. F., Holswade, G. R., and Gore, A. L.: Sudden and Complete Occlusion of the Portal vein in the Macaca Mulatta Monkey. *Ann. Surg.*, 132, (1950): 475-490.
- ⁴Douglas, T. C., Mehn, W. H., Lounsbery, B. F., Swigert, L. L., and Tanture, C. A.: Attempts at the Experimental Production of Portal Hypertension. *Arch. Surg.*, 62, (1951): 785-788.
- ⁵Dragstedt, L. R.: Gradual Obliteration of the Portal Vein as a Substitute for Eck-Fistula. *Science*, 73, (1931): 315.
- ⁶Ekk, N.: K voprosu o perevjaske vorotnoi veni. *Vojenno-Med. J.*, 130, (1877): 1-2.
- ⁷Farrar, T., Bollman, J. L., Gray, H. K., and Grindlay, J. H.: Spontaneous and Induced Canine Venous Collateral Circulation after Chronic Extrahepatic Occlusion of the Portal Vein. *Surg. Forum Am. Coll. Surg.*, (1954): 184-192.
- ⁸Hoffbauer, F. W., Bollman, J. L., and Grindlay, J. H.: Factors Influencing Pressure in the Portal Vein as Studied in the Intact Animal. *Gastroenterology*, 16, (1950): 194-210.
- ⁹Ito, H., and Omi, K.: Klinische und experimentelle Beitrage zur chirurgischen Behandlung des Ascites. *Deutsche Ztschr. f. Chir.*, 62, (1902): 141-183.
- ¹⁰Kershner, D., Hooten, T. C. and Shearer, E. M.: Production of Experimental Portal Hypertension in the Dog; Anatomy of the Hepatic Veins in the Dog. *Arch. Surg.*, 53, (1946): 425-434.
- ¹¹Kusnetzow, M. M.: Zur Frage der operativen Behandlung des Ascites bei Lebercirrhose mittels Omentofixation. Bildung kuenstlicher Verwachsungen in der Bauchhoehle. Klinische und experimentelle Studien. Vorlaeufige Mittheilung. (Wratsch 1900, 33); abstr. by Guckel (B. Karabulsk, Saratow) in *Zentralb. f. Chir.*, No. 4, (1901): 105-106.
- ¹²McIndoe, A. H.: Vascular Lesions of Portal Cirrhosis. *Arch. Path.*, 5, (1928): 23-42.
- ¹³Milnes, R. F. and Child, C. G.: Acute Occlusion by Ligation of the Portal Vein in the Macacus Rhesus Monkey. *Proc. Soc. Exptl. Biol.*, 70, (1949): 332-334.
- ¹⁴Morris, A. N., and Miller, H. H.: Chronic Portal Vein Occlusion and Portal Hypertension in the Dog. *Surgery*, 30, (1951): 768-774.
- ¹⁵Neuhof, H.: Experimental Ligation of the Portal Vein: Its Application to the Treatment of Suppurative Pyelophlebitis. *Surg. Gynec. and Obst.*, 16, (1913): 481-488.
- ¹⁶Oré, M.: Influence de L'oblitération de la veine porte sur la sécrétion de la bile et sur la fonction glycogénique du foie. *Compt. rend. Acad. sci.*, 42, (1856): 463-467.
- ¹⁷Rousselot, L. M., and Thompson, W. P.: Experimental Production of Congestive Splenomegaly. *Proc. Soc. Exptl. Biol.*, 40, (1939): 705-708.
- ¹⁸Rousselot, L. M., and Thompson, W. P. (Quoted by Whipple): The Problem of Portal Hypertension in Relation to the Hepatosplenopathies. *Ann. Surg.*, 122, (1945): 449-475.
- ¹⁹Schiff, M.: Ueber das Verhaeltnis der Leber-Circulation zur Gallenbildung. *Schweiz. Ztschr. f. Heilk.*, 1, (1862): 1-51.
- ²⁰Solowieff, A.: Veraenderungen in der Leber unter dem Einflusse kuenstlicher Verstopfung der Pfortader. *Virchows Arch. f. path. Anat.*, 62, (1875): 195-200.
- ²¹Tilmann: Ueber die chirurgische Behandlung des Ascites. *Deutsche Med. Wchnschr.*, 25, (1899): 284-286.
- ²²Vitums, A.: Portosystemic Communications in the Dog. Presented at 72nd Meet. Am. A. Anatomists, Seattle, Wash., April, 1959; abstr. in *Anat. Rec.*, 133, (1959): 346.
- ²³Vitums, A.: Portal Vein in the Dog. *Zentralb. f. Vet.-med.*, 6, (1959): 723-741.
- ²⁴Vitums, A.: Portosystemic Communications in the Dog. *Acta anat.*, 39, (1959): 271-299.
- ²⁵Volwiler, W., Grindlay, J. H., and Bollman, J. L.: The Relation of Portal Vein Pressure to the Formation of Ascites. An Experimental Study. *Gastroenterology*, 14, (1950): 40-55.
- ²⁶Volwiler, W., Grindlay, J. H., and Bollman, J. L.: Chronic Portal Vein Obstruction in Dogs from Silica Cirrhosis. *Gastroenterology*, 24, (1953): 405-413.

Pentobarbital Safe for Bird Anesthesia

In a discussion at the Annual Congress of the British Veterinary Association in 1960, a veterinarian stated that he had solved the problem of anesthetic deaths in budgerigars by having his own solutions of pentobarbital specially prepared. He found that commercial solutions of pentobarbital varied greatly in potency after they had been kept on the shelf for a period of time. Minimum dosage of pentobarbital was calculated at 1/5 gr./lb. of body weight, either subcutaneously or intramuscularly.—*Vet. Rec.*, 72, (Oct. 22, 1960): 892.

Editorial

Why We Have Extension Veterinarians

The opening paragraph of the job description for extension veterinarians adopted by the USDA Federal Extension Service states that "The role of the extension veterinarian is to conduct an educational program. . ." More specifically, it states that he will cooperate with practicing veterinarians, regulatory officials, extension personnel, and other professional agricultural workers and will assist veterinarians and livestock owners in disease control. He is prohibited from engaging in veterinary practice and from promoting products.

Before there was an extension veterinary service, problems concerning animal diseases were explained to livestock producers largely by practicing veterinarians and by agricultural extension workers. This arrangement was only partially successful because the extension workers often were not qualified to give detailed advice about animal diseases and because practicing veterinarians were sometimes too burdened with the immediate demands of practice to take time to explain the virtues of disease control to those who were not already aware of them. The obvious need for someone to discuss with extension workers and farmers the problem of livestock and poultry diseases and the role of veterinarians in disease control was met by employment of extension veterinarians.

Research developments have been disseminated mainly by bulletins or periodicals and by lecturers at occasional meetings and symposiums. To augment this limited means of disseminating information, extension veterinarians have programmed frequent meetings with interested groups and counselled personally with many individuals. New ideas and discoveries uncovered by research are digested by extension veterinarians who then make them available for practical application. In most areas, it is a responsibility of the exten-

sion veterinarian to analyze research developments and apply them to control programs.

A vital phase of regulatory veterinary medicine has been coordination of efforts of practicing veterinarians, farmers, ex-

In 1941, there were 11 full-time extension veterinarians and other part-time ones. In 1955, extension veterinarians formed a National Association of Extension Veterinarians which meets annually in conjunction with the Annual Meeting of the American Veterinary Medical Association. Today, there are 22 full-time and 13 part-time extension veterinarians in the United States.

tension personnel, and regulatory officials. In this regard, extension veterinarians have been influential. Some have spearheaded brucellosis and tuberculosis eradication programs. Directly and by informing other extension workers, they have explained to farmers proposed control programs for hog cholera, scrapie, sheep scab, and cattle grubs. The success of many of these programs may depend heavily on the efforts of extension veterinarians.

A relatively small number of veterinarians are involved in poultry practice and research. Yet, veterinary guidance in controlling poultry diseases is needed as much as it is for other animal diseases. To bring veterinary guidance to poultry raisers, the extension veterinarian, almost singlehandedly in some areas, has represented the veterinary profession. Extension veterinarians specializing in poultry diseases have been largely responsible for maintaining

among practitioners continued interest in poultry diseases.

Continuing educational programs for veterinarians have been conducted by veterinary associations and colleges for many years, but often these have not been adequate. In most states, such programs are held only once or twice each year. However, in states where extension veterinary service is well developed, continuing veterinary education has been expanded considerably. In Iowa, for example, 32 short courses covering 4 different subject matter fields have been offered to practicing veterinarians by the extension veterinary service.

The veterinary profession, composed principally of individuals dedicated to the

art and science of disease control, has never taken sufficient time to tell of its achievements and its services. This area of neglect has been attended to by extension veterinarians, at least partially, by answering thousands of letters, issuing hundreds of newspaper releases, and participating in dozens of radio and television broadcasts. For the veterinary profession, extension veterinarians have been excellent public relations and information agents.

The contributions extension veterinarians have made to the veterinary profession and to agriculture, are worthy of recognition. We hope that all will view the veterinary extension service in its proper perspective and encourage its growth whenever possible.—A.F.

World Shortage of Veterinarians

International action is necessary to overcome a world shortage of veterinarians, according to Dr. K. V. L. Kesteven, FAO director of animal production. He suggests establishment of an international committee on veterinary education to help overcome the shortage—"in view of an increasing need to expand and develop the world's livestock industry, especially in the underdeveloped countries . . ." He points out that in Great Britain, there is 1 veterinarian for every 30 square miles; in the United States, 1 for every 270 square miles; in South Africa, 1 for every 1,700 square miles; in Canada, 1 for every 1,900 square miles; and in East Africa, there is only 1 veterinarian for every 5,000 square miles.—*USDA Farm Paper Letter*, Sept. 12, 1960.

Antibiotic Contamination of Milk Reaches Lowest Incidence

Present milk supplies are freer from antibiotics than at any time since the drugs were introduced for cattle therapy 15 years ago, according to Professor Frank V. Kosikowski of the New York State College of Agriculture. Of 768,468 milk samples tested since January, only about $\frac{1}{2}$ of 1 per cent included detectable amounts of antibiotic residues. Before 1960, the average incidence of antibiotic residues was about 6 per cent.

In the first year of the testing program which was launched last January, there has been approximately a tenfold decrease in the incidence of antibiotic residues in the United States and about a 15-fold decrease in New York State.—*New York State College of Agriculture Release*, Oct. 31, 1960.

Tests for Tuberculosis in Cattle

A comparison of a hemagglutination test with a modified hemolytic test on serums from intradermal bovine tuberculin reactors and nontuberculous cattle was made. The hemolytic test was superior to the hemagglutination test in detecting antibodies in serum samples from 1,410 intradermal tuberculin reactors. In both tests, less than 7 per cent of the serum samples from 232 nontuberculous cattle had titers of 1:16 and above. However, as presently used, these tests were not as reliable as the intradermal tuberculin test since titers of 1:16 or above occurred in only 54.9 per cent of

the tuberculin reactors with lesions in the hemolytic test and only 35.7 per cent in the hemagglutination test. It was also found that the hemagglutination and hemolytic titers were higher for serum samples from cattle that reacted to the first tuberculin test than for serums from cattle in the same herd that reacted to the second tuberculin test.—[Thomas H. Vardaman: *A Comparison of a Hemagglutination Test with a Modified Hemolytic Test on Serums from Intradermal Bovine Tuberculin Reactors and Nontuberculous Cattle*. *Am. J. Vet. Res.*, 21, (July, 1960): 574-577.]

Neurotropism of Equine Influenza-Abortion Virus

Infant kittens, mice, and hamsters were given various strains of equine influenza virus (EIV) and equine abortion virus (EAV), using the peritoneal, cerebral, nasal, and muscular inoculation routes. The kittens were inoculated with EIV (Grayson I strain) by the intraperitoneal and the intranasal routes, simultaneously. In the mice, EIV (Army 183 strain) and EAV (LSSSL 491 strain) were injected intracerebrally; the EIV was used at the 36th to the 57th passage level (neural adaptation) and the EAV was the first passage level. Hamsters, 20 days old, were inoculated intraperitoneally with EIV (Army 183 strain) of first to the sixth passage level (visceral adaptation); 1-day-old hamsters were inoculated with EAV (LSSSL 491 strain) by the peri-

toneal, nasal, cerebral, and muscular routes.

All of the animals developed lesions of acute encephalitis with characteristic intranuclear inclusion bodies in neurons and neuroglia cells. These lesions, however, were at an early stage in the hamsters given viscera-adapted EIV. In association with the lesions of the central nervous system, characteristic changes (necrosis and intranuclear inclusion bodies) developed in the visceral organs and nasal mucosa, depending on the route (peritoneal or nasal) of inoculation used.—[B. C. Hatzios and R. L. Reagan: *Neurotropism of Equine Influenza-Abortion Virus in Infant Experimental Animals*. *Am. J. Vet. Res.*, 21, (Sept., 1960): 856-861.]

Protein Nature of Negri Bodies

Negri bodies observed within neurons of 4 cattle, 2 cats, and 5 dogs which died of rabies were shown to contain reactive groups normally associated with proteins or polypeptides. By a variety of histochemical methods, it was shown that the matrices of such inclusion bodies consistently contain variable quantities of sulfhydryl groups (cysteine), disulfide linkages (cys-

tine), amino groups (lysine or terminal amino), and tyrosine. Qualitatively, these reactive groups are not significantly altered by the nature of the fixation used, being demonstrable in tissues fixed in alcohol, formalin, and Zenker's acetic solution.

Difficulty is frequently encountered when histologic demonstration of Negri bodies by conventional stains, such as Schleif-

stein's stain, is attempted on tissues fixed in other than mercurial sublimate fixatives. In such instances, the tetrazotized benzidine-beta-naphthol stain or the dinitrofluorobenzene-beta-naphthol stain (for sulfhydryl or tyrosyl groups) would be of value in the detection of Negri bodies. The ferric ferricyanide reduction test also should be

useful, since both the tyrosine and cysteine present in Negri bodies are capable of reducing ferricyanide to ferrocyanide which is converted to insoluble Prussian blue.—[S. W. Thompson II, C. L. Davis, C. L. Turbyfill, and R. W. Thomassen: *The Protein Nature of the Matrices of Negri Bodies*, *Am. J. Vet. Res.*, 21, (July, 1960): 636-643.]

Bactericidal Properties in Rabbit Uteri

Estrous and pseudopregnant rabbits did not have an effective defense against *Escherichia coli* introduced into the uterine lumen after the induction of leukopenia or after inhibition of the leukocytic response. Uteri of control estrous rabbits were highly bactericidal by 4 hours after uterine inoculation, and uteri of control pseudopregnant rabbits were bactericidal by 16 hours. Cell-free inflammatory exudates taken from leukopenic estrous rabbit uteri 4 hours

after inoculation were not bactericidal *in vitro*. Those obtained from control estrous rabbits were highly bactericidal. Development of bactericidal activity in uteri and in cell-free uterine exudates was associated with leukocytic response.—[H. W. Hawk, G. D. Turner, J. F. Sykes: *The Bactericidal Properties of Uteri and Uterine Exudates of Rabbits with Reduced Leukocytic Activity*, *Am. J. Vet. Res.*, 21, (July, 1960): 649-656.]

Propagation of Hog Cholera Virus

Guided by the results of pilot experiments with Newcastle disease virus, various culture conditions were used in the propagation of hog cholera virus in cultures of adult pig spleen tissue fragments.

The most simple method of culture, in which the tissue fragments were suspended in Tyrode's solution plus 10 per cent normal pig serum, gave a final virus titer of 10^{-5} . The main improvements which were effective in raising the final virus titer of the culture were: (1) tissue fragments were fixed and cultivated on a rolling drum and (2) a relatively high concentration of tissue fragments was cultivated under adequate ventilation and frequent changes of culture medium; the tissue concentration was made

to 10 per cent, air was allowed to pass freely through a cotton plug placed at the neck of the culture vessel, and the culture medium was renewed twice daily for the first 2 day of the 3-day cultivation.

The virus titer of a whole culture which had been prepared under the improved culture conditions, was approximately 10^{-5} . This titer was comparable to that obtained from the solid spleen tissue of experimentally infected pigs.—[N. Hayashi, A. Kawakubo, H. Matsuzawa, K. Tomizawa, and J. Nakamura: *Propagation of Hog Cholera Virus in Tissue Culture and Its Application to Vaccine. I. Propagation of the Virus in Tissue Culture*, *Am. J. Vet. Res.*, 21, (July, 1960): 591-596.]

Induced Leukopenia in Rabbits

The drug, N-(3-oxapentamethylene)-N', N'' - diethylenethiophosphoramidate (OPSPA), was employed to produce leukopenia. The uterine bactericidal activity was tested against *Escherichia coli*. Comparisons were

made with untreated controls. Also, for comparative purposes, the uterine horns of both principals and controls were or were not first sensitized with dead *Esch. coli* cells.

Four hours after inoculation, significantly greater numbers of live bacteria were recovered from uterine horns of OPSPA-treated rabbits than from corresponding control rabbits, indicating the importance of leukocytes in the normal bactericidal function of the uterus. Treatment with OPSPA did not significantly affect the response of the uteri in the follicular or luteal phase to sensitization with killed *Esch. coli*; however, residual leukocytes may have clouded the evidence. A significant difference in the

bacterial recoveries from the nonsensitized horns of leukopenic rabbits occurred with the phase of the reproductive cycle. A non-cellular factor was proposed to account for the bactericidal activity in the uteri of leukopenic rabbits in the follicular phase, but some effect of residual leukocytes could not be excluded.—[A. J. Winter, J. Simon, S. H. McNutt, and L. E. Casida: *The Effect of an Induced State of Leukopenia on the Uterine Bactericidal Activity in Rabbits*. *Am. J. Vet. Res.*, 21, (July, 1960): 664-667.]

Inflammatory Uterine Exudates in Rabbits

Uteri of estrous and pseudopregnant rabbits were inoculated with *Escherichia coli* and the resulting exudates were collected. The *in vitro* bactericidal activity was greater in cell-free exudates of estrous than of pseudopregnant rabbits at 4 hours after uterine inoculation, and greater in exudates of pseudopregnant than estrous rabbits at 16 hours. The noncellular bactericidal substances apparently originated in leukocytes, and ovarian hormones influenced the concentration of bactericidal sub-

stances by controlling the leukocytic response. *In vitro* pleural cavity inflammatory exudates from estrous and pseudopregnant rabbits were equally bactericidal to *Esch. coli* after being heated to inactivate *E. coli*-killing blood serum bactericidins.—[H. W. Hawk, G. D. Turner, and J. F. Sykes: *Non-cellular Bactericidal Factors in Inflammatory Exudates from the Uterine and Pleural Cavities of Estrous and Pseudopregnant Rabbits*. *Am. J. Vet. Res.*, 21, (July, 1960): 657-663.]

Histopathology of FMD in Mice

Pregnant Rockefeller strain-H mice were inoculated with tissue culture-adapted foot-and-mouth disease virus, type A, strain 119, 7 days before parturition; lactating mice were inoculated 7 and 10 days after parturition. Forty to 70 per cent of the mice developed fatal infections.

The microscopic tissue changes consisted of necrosis of pancreatic acinar cells, development of laminated intracytoplasmic bodies in some pancreatic acinar cells, severe myocardial necrosis, slight skeletal muscle necrosis, accidental involution of

the thymus, and destruction of lymphocytes in the spleen and lymph nodes. The laminated bodies in the pancreatic acinar cells were morphologically similar to those observed in adult mice infected with the PL5 strain of pleurodynia virus. The possible relationship of both stress and direct virus-cell interaction to thymic involution and systemic lymphocytic destruction were discussed.—[H. R. Siebold: *The Histopathology of Foot-and-Mouth Disease in Pregnant and Lactating Mice*. *Am. J. Vet. Res.*, 21, (Sept., 1960): 870-877.]

Dictyocaulus viviparus in Laboratory Animals

Third-stage larvae of *Dictyocaulus viviparus* were administered to rabbits, guinea pigs, hamsters, rats, mice, and goats to study the establishment and duration of infection in small laboratory animals. No ma-

ture lungworms were recovered from any of these species. The guinea pigs appeared to be more susceptible than other species studied. Infection persisted longer in this species, and anorexia, weight loss and,

sometimes, death occurred. The biological half-life of lungworms in guinea pigs was calculated to be 1.35 days. Infected guinea pigs manifested lymphopenia and an increase in neutrophils and monocytes. Eosinophils and basophils did not change perceptively. Electrophoretic analysis of the serums revealed an increase in the gamma globulin by the 30th postinfection

day. No increases were noticed in the *alpha* and *beta* globulin fractions. Complement-fixation titers rose to 1:17 by 30 days postinfection.—[A. E. Wade, L. E. Fox, and L. E. Swanson: *Studies on Infection and Immunity with the Cattle Lungworm, Dictyocaulus viviparus* (Bloch). I. Infection in Laboratory Animals. *Am. J. Vet. Res.*, 21, (Sept., 1960): 753-757.]

New Books

A Laboratory Guide in Virology

The fourth edition of this manual is an improvement over the previous edition. The quality of paper has been greatly improved, and the more significant new information and techniques in virology, especially tissue culture procedures, have been included. The manual is presented as a series of 51 laboratory exercises in virology. These are well organized under major sections such as: (1) equipment, (2) collection, preservation, and preparation of specimens, (3) filters, (4) cultivation of viruses, (5) serology, (6) immunology, (7) pathology, (8) environmental influences, and (9) physical methods. Each

exercise is outlined in detail and is accompanied by valuable, basic information on techniques and procedures. The manual is intended to be a flexible laboratory guide for advanced undergraduate and graduate students. It accomplishes this purpose. It should also be of interest and value to beginning technicians and others interested in virology.—[*A Laboratory Guide in Virology*. By Charles H. Cunningham. 4th ed. 173 pages. Burgess Publishing Co., 426 S. 6th St., Minneapolis 15, Minn. 1960. Price not given.]-L. C. GRUMBLES.

Principles of Veterinary Pathology

Two internationally known authorities in veterinary pathology, Drs. William S. and Andrew W. Monlux, have joined the author of *Animal Pathology*, Dr. Russell A. Runnels, in preparing this comprehensive and up-to-date discussion of the latest developments and techniques in veterinary pathology.

Among the special features of this edition not included in its predecessor, *Animal Pathology*, are sections on muscles, bones, and joints and an expanded section on neoplasms, including a histogenetic classification table. All parts of the book, have been revised and expanded to help both practicing and research veterinarians keep abreast of new information in pathology.

The authors discuss etiology in considerable detail and incorporate disturbances in development, circulation, nutrition and growth of cells, cell metabolism, death, defenses of the body against injury, concretions, and neoplasms. The section on special pathology covers cardiovascular, hematopoietic, respiratory, digestive urinary, genital, nervous, locomotor, and cutaneous systems.—[*Principles of Veterinary Pathology*. By Russell A. Runnels, William S. Monlux, and Andrew W. Monlux. 732 pages; illustrated. Iowa State University Press, Ames, Iowa. 1960. Price \$12.50.]

News

AVMA Executive Board District I Meeting Held in Rhode Island

On Oct. 16, 1960, the AVMA Executive Board District I meeting was held in conjunction with the 1960 New England Veterinary Medical Association meeting in Providence, R.I. AVMA District I is comprised of the New England states—Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont. Attending the meeting were the AVMA delegates, alternates, and constituent association officers from the New England States, as well as representatives of the AVMA central office staff, and AVMA officers. Principal speakers were Dr. Mark Morris, president-elect of the AVMA, Dr. H. E. Kingman, Jr., executive secretary, Brig. Gen. J. A. McCallam, AVMA Washington representative, Dr. Arthur Freeman, assistant editor of the JOURNAL, and Dr.

Myron G. Fincher, District I Executive Board representative and chairman of the meeting.

The purpose of this District I meeting was to bring to the attention of constituent association representatives the current objectives of the AVMA and to describe the progress being made toward attaining them. The resolutions introduced to the House of Delegates at the 1960 annual meeting in Denver were reviewed and discussed. Of particular interest was the resolution proposing adoption of a mail ballot for electing the president of the AVMA. Although the veterinarians attending agreed that certain advantages would accrue from use of the mail ballot, a number of disadvantages were given lengthy consideration. Among these disadvantages discussed were the belief that the mail ballot would permit individuals outside the veterinary profession to influence voting, that certification of eligibility of each voter would be laborious and expensive, that candidates would have to announce their intentions well in advance of election, and that excessive and possibly deleterious politicking and propagandizing would take place.

Another resolution discussed at length at the District I meeting concerned the proposed requirement for continuing membership in a constituent association in order to maintain AVMA membership. It was pointed out that such a requirement would not necessarily be desirable because of the licensing restrictions imposed in several states, the need for maintenance of accurate records at the state and national levels, the belief that compulsion is not desirable, and the fact that there is a problem of integration in the southern states.

A program for promoting legislative action at the national level was discussed by Gen. McCallam.

During the past year, several districts

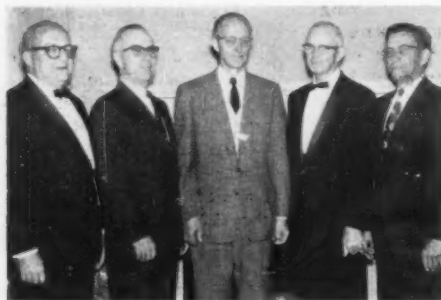


AVMA representatives who attended the AVMA District I meeting are (seated, left to right): Dr. H. E. Kingman, Jr., executive secretary, AVMA; Dr. Mark L. Morris, AVMA president-elect; Dr. Myron G. Fincher, Executive Board member, District I; (standing, left to right): Dr. Arthur Freeman, assistant editor, AVMA publications; Dr. Charles deVarennes, Massachusetts V.A. representative to AVMA; and General J. A. McCallam, AVMA Washington representative.

have had meetings with AVMA representatives in conjunction with state or area meetings as the New England V.M.A. has done. The AVMA officers and central office staff help set up such district meetings in any district in the United States and Canada upon the request of the appropriate Executive Board member.

New England V.M.A. Meeting Follows AVMA District I Session

Following the AVMA District I meeting on Oct. 16, 1960, the New England V.M.A. convened for its annual meeting October 16-19.



New England V.M.A. 1961 officers shown following election, with AVMA president-elect (left to right): Drs. C. Lawrence Blakely (HAR '98), Needham, Mass., secretary-treasurer; Lewis B. Denton (COR '32), Houlton, Maine, president; Mark L. Morris (COR '26), Allenspark, Colo., AVMA president-elect; Warren J. Comstock (USC '26), Clayville, R.I., immediate past-president; and John MacIntosh (COR '28), Kensington, Conn., president-elect.

The association had scheduled a full four days of scientific meetings and presentations as well as business sessions. Throughout the four days of the meeting, educational films were shown simultaneously with the scientific sessions. Veterinarians were free to attend whichever form of post graduate education they felt would benefit them most.

AVMA Executive Board District III Meeting Held in South Carolina

On Sunday, Oct. 23, 1960, officials of the AVMA Executive Board District III met at the Francis-Marion Hotel in Charleston, S.C., in conjunction with the Southern Vet-

erinary Medical Association Convention. Attending the meeting were the delegates, alternates, and southern constituent association officers from District III, AVMA President E. E. Leasure, Chairman of the Executive Board J. O. Knowles, AVMA Director of Professional Relations J. R. Hay, Assistant Editor of the J.A.V.M.A. Arthur Freeman, and AVMA Washington Representative J. A. McCallam. District III is comprised of the states of Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina, and Tennessee, and Puerto Rico.

The purpose of the meeting was to discuss with the district representatives the current objectives of the AVMA and plans for attaining these objectives.

The actions taken by the House of Delegates at the 1960 AVMA annual meeting at Denver were reviewed by Dr. Hay. Among the resolutions discussed was the one proposing continuing constituent association membership in order to maintain membership in the AVMA. At least three reasons were advanced for not favoring this resolution: (1) many retired veterinarians in such states as Florida are not members of a constituent association, yet wish to retain AVMA membership; (2) problems of integration of veterinarians in the southern states have not been solved; and (3) continuing membership as stated in the proposal required that membership must be maintained in the constituent organization that recommended the individual's acceptance.

Some of the advantages and disadvantages of a mail ballot were discussed. Principal disadvantage mentioned was the influence that could be wielded by individuals outside the veterinary profession to influence voting for proposals that were not necessarily beneficial to the profession.

Another issue discussed pertained to hospitality suites at conventions. Most of those present at the District III meeting seemed to favor the existing ban. Also discussed was the need for development of continuing education programs sponsored by the AVMA in conjunction with constituent association meetings or as separate sessions.

Southern V.M.A. Meeting Follows District III Session

The annual meeting of the Southern V.M.A. immediately followed the AVMA District III session. The Southern V.M.A.

held a four-day meeting, from October 23 to October 26. Meeting registration was 450.

Dr. E. E. Leasure, AVMA president, appeared on the program Monday, October 24, discussing the activities of AVMA's six councils, executive board, and headquarters staff, as well as membership benefits.

Also representing the AVMA at the meeting, Dr. Jack Knowles, chairman of the AVMA Executive Board, moderated a symposium on geriatrics in small animal practice.

The planning committee for the convention did not program scientific sessions when recreation facilities were available, assuring better attendance at the scientific sessions. There were no hospitality suites at the meeting.

Officers elected at the meeting are Drs. J. L. Sledge (AUB '43), Greensboro, Ala., president; Karl R. Owens (AUB '35), Gainesville, Fla., president-elect; J. Wiley Wolfe (TE '42), Stillwater, Okla., first vice president; A. A. Husman (CIN '17), Raleigh, N.C., secretary; and M. R. Blackstock (COL '10), Spartanburg, S.C., treasurer. Dr. Blackstock has been the association's treasurer for more than thirty years.

Animal Care Panel Meets

To exchange information on the production, care, and study of animals used in medical research, more than 750 medical investigators, veterinarians, animal technicians, laboratory animal producers, and laboratory equipment suppliers met at the 11th annual Animal Care Panel session Oct. 26-28, 1960, in St. Louis, Mo.

A program of formal scientific sessions, panel discussions, workshops, exhibits, and films all concerned with nutrition, diseases, genetics, management, housing, equipment and techniques for research through the use of laboratory animals was presented.

The highlight of the meeting was the unanimous vote of the Animal Care Panel's board of directors to disapprove Senate Bill 3570. The bill would require governmental certification of all laboratories in which federally supported animal experimentation is conducted and would require the licensing of every scientist working on these projects. It would further require prior approval of

every research plan, and an annual report on all experiments performed during the year.

Regarding the bill, 1960 Animal Care Panel President Dr. Bennett J. Cohen (COR '49), University of California School of Medicine, Los Angeles, said in his presidential address:

"It is an interesting paradox that despite the important progress of the past decade in our field, despite unequivocal evidence that scientists are determined to meet their obligations and responsibilities in the area of animal experimentation, the clarion call of those favoring federal restriction and regulation of biological scientists has grown louder and louder.

"On May 18, 1960, Senator John Sherman Cooper and 12 co-sponsors introduced Senate Bill 3570 'to provide for the humane treatment of animals used in experiment and tests by recipients of grants from the United States and by agencies and instrumentalities of the United States government, and for other purposes.' Three identical bills subsequently were introduced in the House of Representatives. The congress adjourned early in September without taking action on the bills; however, there is every likelihood that they will be reintroduced in January, 1961.

"... We see a legislative proposal whose enforcement would require expensive, massive, and totally unproductive regulatory machinery. We see delay, and more delay in testing new concepts and ideas, while awaiting the "approval" stamp. We see a significant reduction in the investigator's productive research time while he completes the useless applications, forms, and reports required of him. We see innumerable problems of interpretation brought on by the vagueness in terminology and many of the provisions. Perhaps worst of all from our particular point of view we see a legislative proposal which has no constructive provisions to deal with our real current needs in laboratory animal care: namely, to encourage serious research in significant animal care problems; to provide greater support of professional and technical training; to encourage even wider dissemination of factual information in the field; and to support the improvement of existing animal facilities and the construction of new facilities."

Dr. Cohen then called for constructive, self-regulation and greater support of re-

search and training programs as the best means of advancing the welfare of laboratory animals.

Also at the meeting, the 1960 Charles A. Griffin Award for distinguished service in the field of laboratory animal care was presented to Dr. Nathan R. Brewer (MSU '37), associate professor in the department of physiology and superintendent of animal quarters at the University of Chicago.

The Griffin Award was established in 1956 to honor the late Charles A. Griffin, veterinary bacteriologist at the New York State Department of Health Laboratories in Albany, who devoted much of his career to developing colonies of laboratory animals free from any serious infectious diseases.

In receiving this highest award that the field of laboratory animal care offers, Dr. Brewer said, "The number and value of laboratory animals is increasing annually at such a rate that it has been predicted that

by the year 2000 it may approach the value of the farm livestock industry in this country. The great value of laboratory animals lies not only in their increasing numbers,



Officers of the Animal Care Panel are (left to right) Drs. Bennett J. Cohen (COR '49), Los Angeles, Calif., president; Robert J. Flynn (MSU '44), Lemont, Ill., secretary-treasurer; Melvin M. Rabstein (UP '37), Frederick, Md., president-elect; and L. R. Christensen, New York, N.Y., vice president.

but in their increasing quality. Germfree animals derived from germfree sources, animals conditioned so that predictable reactions to specific stimuli may be expected are only a few of the many reasons why laboratory animals are increasing so in value."

Officers elected at the meeting are: Drs. Melvin M. Rabstein (UP '37), Frederick, Md., president, 1961; L. R. Christensen, New York, New York, vice president; and Robert J. Flynn (MSU '44), Lemont, Ill., secretary-treasurer.



Dr. Nathan R. Brewer (MSU '37) shown just after being named winner of the 1960 Charles A. Griffin Award by the Animal Care Panel for distinguished service in the discipline of laboratory animal care.

Museum to Display Veterinary Office of Yesteryear

An old-time veterinarian's office will be set up for permanent display at the Pennsylvania Farm Museum of Landis Valley, Pa. The Museum's director believes that this will be the only such exhibit in the country.

Until early last summer, the quaintly-equipped office was in actual service in Mount Joy, Pa., where the late Dr. Ezra W. Newcomer practiced veterinary medicine from June, 1899, until shortly before his death last July (see *J.A.V.M.A.*, 137, Oct. 15, 1960: 499).

Much of Dr. Newcomer's equipment and instruments had been used by his father-in-law, Dr. H. F. Breneman, and before that by Dr. Breneman's father, Dr. John Breneman, all Lancaster County, Pa., veterinarians.

After his death, Dr. Newcomer's 3 children decided to donate the office, with its equipment, instruments, pot-bellied stove, cabinets, shelves, books, and even some medicine compounded by Dr. Newcomer, to the Pennsylvania Farm Museum in memory of the 3 veterinarians who had used it.

The collection includes drug and dosing bottles, mortars, pestles, instrument cases, equine dental instruments, obstetrical forceps, branding irons, and containers for mixing powders and liquids. The coconut-shell measures devised by Dr. Newcomer to portion out medications will also be part of the exhibit.

Dr. Newcomer received his V.M.D. degree from the University of Pennsylvania in 1899. Neither Dr. Breneman, nor his father, Dr. John Breneman, had any formal training in the veterinary arts. They learned it by apprenticeship.

Dr. Newcomer had been made an honorary member of the AVMA in 1951.

Milk Sanitarians Hold Mastitis Action Conference

At the International Association of Milk and Food Sanitarians held at Chicago's Morrison Hotel, a "Mastitis Action Conference" met Oct. 29, 1960. The purpose of the conference was to make known the current status of the mastitis problem in the United States and to determine what could be done.

The morning session, introduced by Dr. K. G. Weckel, University of Wisconsin, consisted of 10 presentations by individuals nationally prominent in dairy science, industry, disease control, research, and education. Among the subjects singled out for emphasis to the 200 conferees was the problem of defining mastitis as a disease. This problem posed difficulties because mastitis may be due to many causes.

The fact that milk-borne diseases occasionally cause serious problems in man was discussed by Dr. James H. Steele, chief, veterinary public health, Communicable Disease Center, PHS, Atlanta. It was mentioned that staphylococci of the type that have created serious problems in hospitals have been isolated from mastitic milk.

Half Billion Dollar Loss

Estimates of total losses due to mastitis on a national basis were given by Dr. H. G.

Hodges, supervising veterinarian, New York State Mastitis Control Program, Cornell University. They were approximately double the previous estimates given out by the USDA in 1954. Including expenditures for medications, in addition to losses in milk production, current losses were estimated at $\frac{1}{2}$ billion dollars a year.

A prominent veterinary practitioner, Dr. C. J. Haller, Avon, N.Y., who is located in a well-developed dairy area, indicated that mastitis due to *Streptococcus agalactia* could be eliminated from most herds under a mastitis-control program. After 5 or 6 years, he was able to eliminate *Str. agalactia* from 24 of 33 herds in his practice area. During the same period, staphylococcal mastitis increased from 23 to 29 per cent.

Dr. James M. Murphy, School of Veterinary Medicine, University of Pennsylvania, said that few facts which are based on good research are known concerning mastitis. Known for certain is the fact that eradication of mastitis due to *Str. agalactia* is scientifically possible because the organism is an obligatory parasite of the bovine mammary gland. Also known is the fact that antibiotics are effective against *Str. agalactia* infection but only moderately effective against other streptococci and staphylococci. Their effectiveness against bacilli and other organisms is slight. It was Dr. Murphy's opinion that efforts to strengthen the cow's resistance to mastitis by proper management could be made through scientific research.

Limitations of Pasturization Cited

Mr. Paul Corash, chief, Milk Division, Bureau of Food and Drugs, City of New York, stated that too much emphasis has been placed on pasteurization as a means of controlling milk-borne diseases. It was his opinion that pasteurization would not affect the presence of dangerous staphylococcal toxins in milk, which, to date, have been controlled principally by refrigeration and dilution of toxin in the general milk supply. He admonished veterinarians to maintain high ethical standards in conducting control programs with dairymen and to make examinations carefully and thoroughly. Even though physical examinations would be helpful in eliminating some mastitic cows, he said, diagnostic aids of a more technical nature are necessary. The California Mastitis Test was considered satisfactory. He urged a program of testing based on periodic white blood cell counts in milk,

retesting, segregation of infected cows, veterinary certification to attest good health of new cows, and training of sanitarians and field men.

\$5 Million Requested for Research

The research section, under the direction of Dr. C. A. Manthei, Animal Disease and Parasite Research Division, USDA, Beltsville, Md., recommended that more research should be conducted to determine the cell count and flora of normal udder secretions, to determine paths by which infections enter the udder, to determine predisposing factors, to study casual organisms more thoroughly, and to further evaluate mastitis tests. He mentioned the need for employing large-scale controlled field trials. Appropriations of approximately \$5 million a year for research were considered necessary.

More Educational Material Recommended

Dr. O. W. Schalm, Department of Veterinary Medicine, University of California, represented the group on education. He recommended that more information on mastitis be distributed to the farmer-dairyman and that the printed material be written so the farmer can readily understand it and be brief enough to be read "between the mailbox and the barn." The group felt that the farmer should be motivated to utilize mastitis prevention methods on the basis of how application of these methods would affect his pocketbook.

The regulatory group was represented by James A. Meany, chief of dairy inspection, Chicago Board of Health, Chicago, Ill. They recommended that uniform mastitis control programs be instituted, that effective tests for mastitis be utilized, that the tests be interpreted accurately, and that industry participation be obtained to make the regulatory program effective. It was further recommended that adequate educational material be made available concerning veterinary and management aspects of mastitis.

In order to maintain a continuing organization to foster national efforts in mastitis control, Dr. J. C. Flake, Farm Methods Committee, IAMFS, Chicago, representing the group studying a national mastitis organization, recommended that a national committee on mastitis be formed comprising 1 to 3 representatives from several interested organizations, that this committee function as a continuing body on a national basis and as a coordinator of research and

educational efforts, that membership be open to anyone interested, and that appropriate organizations be contacted.

The program to obtain organizational support for mastitis control was presented by George Willits, Johnson and Johnson Company, Chicago. The group he represented felt that the mastitis action program should be supported financially on a voluntary basis by interested organizations. Funds would be raised from within the industry and further details of fund-raising would be studied later.

General chairman for the afternoon session was Dr. J. R. Hay, AVMA director of professional relations.

American Association of Avian Pathologists Meets

At a recent meeting of the American Association of Avian Pathologists, Dr. S. B. Hitchner (UP '43), Madison, Wis., was elected president; Dr. H. E. Adler (WSU '31), Glendale, Calif., vice-president; and Dr. M. S. Cover (UP '38), Newark, Del., secretary-treasurer.

Fifty-five of the Association's 205 members were present at the meeting and heard reports showing that in the past year the association has been incorporated as a non-profit organization in the State of Delaware and has taken the responsibility of publish-



Two British visitors who conferred recently with Dr. H. E. Kingman, Jr., AVMA executive secretary, at the AVMA office were Dr. W. G. Senior (center), council chairman of the Royal Society of Health and chief dental officer of England's Ministry of Health, and Mr. P. A. Wells (right), secretary of the Royal Society of Health. The society, which has many American members, is made up of physicians, dentists, veterinarians, sanitarians, and architects.

ing the *Journal of Avian Diseases*. Other reports were given by the committee on investigation of education in the field of poultry diseases in veterinary schools, the committee on reporting poultry diseases, the committee on pullorum eradication, and the committee on industrial relations.

Board members of the association are Drs. P. O. Levine (COR '32), Ithaca, N.Y.; A. I. Flowers (TEX '50), College Station, Texas; M. S. Hofstad (ISU '40), Ames, Iowa; and L. Raggi (PER '44), Davis, Calif.

Course in Veterinary Mycology Offered

A one-week course in laboratory diagnostic methods in veterinary mycology will be offered by the Communicable Disease Center, Public Health Service, Atlanta, Ga., March 6-10, 1961.

It is designed to familiarize veterinarians, laboratory workers, and teachers in veterinary medicine with procedures for detecting, isolating, and identifying fungi which produce mycotic infections in animals. The etiologic agents will be studied in tissue and in culture. Methods of diagnosis covering specimen collection, culture mediums, laboratory animal inoculations, and other procedures will be described, used, and demonstrated. The symptomatology, epizootiology, public health importance, and current treatment of the individual diseases also will be stressed.

Personnel of the Center's Mycology Unit will present the material. The class will be limited to 22 students. Application forms and additional information are available at the Training Office, Laboratory Branch, Communicable Disease Center, Atlanta 22, Ga.

Dr. C. W. Wilder New Assistant Chief Staff Officer, Tuberculosis Eradication

Dr. Clifford W. Wilder (OSU '35) has been appointed assistant chief staff officer, tuberculosis eradication, by the Animal Disease Eradication Division, Agricultural Research Service, USDA. His promotion from staff assistant, tuberculosis eradication, became effective in June, 1960.

Entering federal service in 1935 with the Bureau of Animal Industry, Dr. Wilder per-

formed field work on the tuberculosis and brucellosis eradication programs in Alabama, North Carolina, and Virginia until 1941. From 1941 to 1946, he served as an officer in the Veterinary Corps of the U.S. Army.

Dr. Wilder returned to tuberculosis and brucellosis field work in 1946, serving in North Carolina and New York. From 1948 to 1957, he was coordinator in western New York state. He received special diagnostic



Dr. Clifford W. Wilder

training in 1950 and spent considerable time in the vesicular exanthema eradication program in New York, New Jersey, Pennsylvania, and the New England area. In 1957 and 1958, he served as assistant veterinarian in charge in Pennsylvania. He has been a staff assistant in the tuberculosis eradication program since January, 1959.

Dr. Wilder is a member of the AVMA and the National Association of Federal Veterinarians.

Dr. P. H. Kramer to Assist at Springfield Eradication Post

Dr. Paul H. Kramer (OSU '51) has been appointed assistant veterinarian in charge, Springfield, Ill., Animal Disease Eradication Division, by the Animal Disease Eradication Division, Agricultural Research Service, USDA. He began working in Springfield Aug. 21, 1960, leaving his former post as



Dr. Paul H. Kramer

assistant veterinarian in charge at Atlanta, Ga.

From 1951 to 1955, Dr. Kramer maintained a private practice in Mt. Vernon, Ohio. He entered federal service in Ohio, where he was an area veterinarian until July, 1957, and district veterinarian in eastern Ohio from July, 1957, to September, 1958. He participated in the Fifth Veterinary Administrator Development Program from September, 1958, to June, 1959, and was then transferred to Atlanta, Ga., as assistant veterinarian in charge.

Dr. Kramer is a member of the AVMA and the Georgia Veterinary Medical Association.

Dr. O. W. Seher Retires

Dr. Otto W. Seher (COL '13), assistant director of the northern area of the Meat Inspection Division, Agriculture Research Service, USDA, retired Nov. 30, 1960, after more than 46 years of service.

Immediately following graduation from veterinary college, Dr. Seher joined the Meat Inspection Service at Fort Worth, Texas, where he was assigned to a special detail at Sacramento, Calif., to assist in the eradication of an epizootic of foot-and-mouth disease. He returned to Fort Worth as assistant veterinarian at the station and, in 1927, was promoted to the position of inspector in charge, Atlanta, Ga.

With this position, Dr. Seher began a series of upward steps. With the exception

of one assignment as associate veterinarian at the large New York City station, he held inspector in charge positions at Mason City, Iowa; Pittsburgh, Pa.; South St. Joseph, Mo.; Sioux City, Iowa; and St. Louis, Mo., through 1941.

In January of 1945, Dr. Seher was named chief of the inspection operations section of the Washington staff. In 1947, he was re-



Dr. Otto W. Seher

assigned to the Inspection and Quarantine Division and assisted in the direction of a campaign against foot-and-mouth disease in Mexico. He returned to the Meat Inspection Division as inspector in charge of the Chicago, Ill., station. In 1958, Dr. Seher was named assistant director for the northern area of the division with headquarters at Chicago, Ill., a position he held until retirement.

Dr. Seher received cash awards and certificates of merit in 1956 and 1958. In 1952 he was cited for leadership in improving public service and was given the Superior Service Award of the Department of Agriculture.

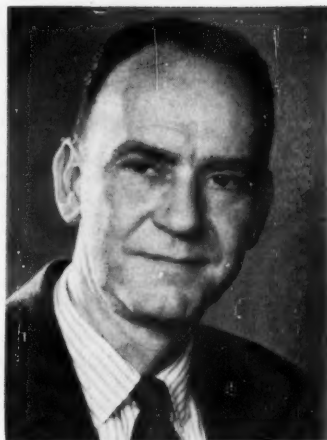
Dr. L. J. Rafoth to Replace Dr. Seher

Dr. Leslie J. Rafoth (ISU '43) has been named assistant director for the northern area of the Meat Inspection Division, USDA, with headquarters in Chicago. He succeeds Dr. Otto W. Seher, who retired recently.

Dr. Rafoth has been a member of the



Dr. Leslie J. Rafoth



Dr. Benjamin M. Cox

Washington staff for the past two years as chief staff officer for animal foods. He entered the Meat Inspection Service in 1949 at Dubuque, Iowa, and during later assignments was stationed at Green Bay, Wis., as inspector in charge, and in Chicago, Ill. He was a member of the U.S. Army Veterinary Corps from 1943 to 1946.

Dr. B. M. Cox Sent to East Africa By USDA

Dr. Benjamin M. Cox (AUB '42) has arrived in Kikuyu, Kenya, East Africa, where he will be in charge of the laboratory of the Animal Disease and Parasite Research

Division, Agriculture Research Service, USDA. Dr. Cox is relieving Dr. Donald E. DeTray, who is returning to this country after six years at the East African laboratory.

Dr. Cox, a member of the staff of the Plum Island (New York) Disease Laboratory for seven years, will be in charge of the research investigations of such diseases as African swine fever and rinderpest. Knowledge of diseases of animals in foreign lands is important to the USDA so that it can guard against entry of exotic diseases into this country or, if they do gain entry, detect them early so that steps can be taken to eradicate them immediately.

VETERINARIANS AWARDED ADVANCED DEGREES

The following listing reports the advanced degrees awarded to veterinarians during the 1959-1960 academic year as well as some not previously reported to us during 1958-1959.

AWARDED MASTER OF SCIENCE (M.S.) DEGREE

Name of Student	Title of thesis	Dept. and School	Date granted
Mohamed Tewfik Fawi Abdu Allandin Ahamad	The Diagnosis of Nocardiosis in Dogs by the Skin Test and the Complement Fixation Test	Dept. of Path., KSU	January, 1960
Chuanpis Ansulayotin	Nerve Supply to the Shoulder, Elbow, Carpal, Hip, Stifle, and Tarsal Joints of the Dog as Determined by Gross Dissection	Dept. of Vet. Physiol. and Pharmacol., MO Dept. of Anat., COR	June, 1960 June, 1960
John C. Bartley	Studies of Metabolism and Toxicity of Stable Strontium in Young Pigs with the Aid of Radiostrontium	ILL	February, 1960

AWARDED MASTER OF SCIENCE (M.S.) DEGREE—Cont'd

Name of student	Title of thesis	Dept. and School	Date granted
Harry H. Berrier, Jr.	Diagnostic Aids in the Practice of Veterinary Medicine	Dept. of Vet. Path., MO	June, 1960
Robert S. Brodey	Clinical and Pathological Study of 130 Oral and Pharyngeal Neoplasms in the Dog	Dept. of Vet. Surg., UP	June, 1959
Roger E. Brown	Experimental Study of Femoral Head Prosthesis in Small Animals	Dept. of Surg., and Med., MSU	March, 1960
Edward A. Carbrey	Comparison of Serological Techniques for the Diagnosis of Leptospirosis	Dept. of Vet. Hyg., ISU	May, 1960
K. P. Chandrasekharaw	A Survey of Animal Neoplasms with Special Reference to Incidence and Site of Origin	Dept. of Vet. Path., MO	January, 1960
Brian C. Commings	A Study of the Normal and Collateral Angioarchitecture of the Pelvic Limb of the Dog Using Radiopaque Media and Gross Dissection Techniques	Dept. of Anat., KSU	June, 1960
P. S. Das		Dept. of Vet. Physiol. and Pharmacol., MO	January, 1960
John L. Durr	An Experimental and Clinical Study of Toggle Pin Fixation of Recurrent Coxofemoral Luxation in the Dog	AUB	June, 1960
Amin Mahmoud Eisa	Critical Evaluation of Dephenium Hydroxynaphtholate as an Anthelmintic in Cattle	Dept. of Path. and Bact., COL	June, 1960
David J. Ellis		Dept. of Surg. and Med., MSU	December, 1959
Sidney A. Ewing	Investigations on the Genus <i>Metastrongylus</i> Molin, 1861 (Nematoda: Metastrongylidae)	Dept. of Vet. Sci., College of Agric., WIS	May, 1960
Max J. Freeman	Studies on the Role of Hypersensitivity in Erysipelas, Arthritis and Carditis	Dept. of Vet. Sci., College of Agric., WIS	January, 1960
Thomas E. Fritz	Neutralization of Transmissible Gastroenteritis Virus	ILL	August, 1960
Albert A. Gabel	Intravenous Ether Anesthesia in Equines	Dept. of Vet. Surg. and Radiol., OSU	December, 1959
John B. Gratzek	A Study of Winter Dysentery and Virus Diarrhea—New York of Dairy Cattle	Dept. of Vet. Sci., College of Agric., WIS	January, 1959
John H. Greve	Perivascular and Neuroglial Reactions in Brains from Neurologically Asymptomatic Chickens	Dept. of Vet. Path., MSU	December, 1959
Ellis M. Hall	A Study of Hypertrophic Osteoarthropathy in Dogs Including a Radiographic Survey of 900 Clinical Cases at Ohio State University	Dept. of Vet. Surg. and Radiol., OSU	August, 1959
Robert L. Hamlin	The Ventricular Activation Process and Deviation of the Body Surface Potentials of the Goat	Dept. of Vet. Physiol. and Pharmacol., OSU	March, 1960
Frank A. Hayes, Jr.	A Preliminary Investigation to Determine the Practical Application of Keratoplasty for Canine Patients	Dept. of Small Anim. Surg. and Med., AUB	January, 1959
Edward J. Hinsman	Liver Function Studies in the Bovine	Dept. of Surg. and Med., MSU	March, 1960
Robert A. Holmes*	Microscopic Anatomy of the Skin of the White Rat	Dept. of Anat.	June, 1960
Ganpatrao M. Kangude	Tissue Culture Propagation of the Fowlpox Virus	ILL	February, 1960
P. B. Kuppaswamy	Studies with <i>Leptospira</i> Str. 91 in Guinea Pigs with Special Reference to Skin Sensitivity Tests	Dept. of Vet. Path., MO	January, 1960
Balkrishna Lamikant Purohit	Clinical Observations and Histopathological Studies of Two Organic Phosphorous Compounds in Rabbits	Dept. of Path., KSU	June, 1960
Albert L. Luedke	Intensification of Hog Cholera Infection by Extracts of <i>Ascaris suum</i>	Dept. of Agric. Bio. Chem., UP	August, 1960
Muhammad Abdul Majeed	Some Epizootiological Aspects of Canine Distemper	WSU	May, 1960
Chester F. Meinecke	The Effects of Exogenous Testosterone Spermatogenesis of Bulls	Dept. of Vet. Physiol., OKL	May, 1960
Zafer-Ud-Din Mian	The Regulation of Estrus in Cows by Parenteral Injection of Hormones (Oxvotocin, ECP, and Progesterone, Progesterone and ESH)	WSU	May, 1960
Allen Y. Miyahara	Myopathy produced by the Phenothiazine-derived Tranquilizers	Dept. of Vet. Path., ISU	May, 1960
Joseph A. Molello	Histochemistry of the Deer Antler	Dept. of Anat., COL	June, 1960

*Robert A. Holmes will receive his D.V.M. degree in June, 1961.

AWARDED MASTER OF SCIENCE (M.S.) DEGREE—Cont'd

Name of student	Title of thesis	Dept. and School	Date granted
Ulreh V. Mostosky	Transolecran Approach to the Elbow Joint and the Clinical Application in small Animals	Dept. of Surg. and Med., MSU	December, 1959
Dhruva Ranganath Mudholkar	An Anatomical-Radiological Study of the Arteries of the Distal Extremity of the Thoracic and Pelvic Limbs of the Ox, Dog, and Horse	Dept. of Anat., KSU	August, 1960
D. B. Mukkerjee	Studies of Some Aspects of Clamping the Common Carotid Artery in the Dog, Goat, and Cow	Dept. of Vet. Med. and Surg., MO	June, 1960
Edward Cyril Murphy	Normal and Leukemoid Peripheral Blood in the Treatment of Irradiation Injury in the Rat	Dept. of Path. and Bact., COR	February, 1960
Devarakonda K. Murty	Some Serological Methods for Diagnosis of Duck Virus Hepatitis	ILL	February, 1960
Reza Naghshinch		Dept. of Vet. Path., MSU	June, 1960
Virendra Patel	A Histopathological Study of Bovine Ocular Squamous Carcinoma, and Its Comparison with Carcinoma of the Horn of Oriental Cattle	Dept. of Vet. Path., MO	June, 1960
William H. Patton	Some Serological Studies of the Virus of Calf Pneumonia-Enteritis	Dept. of Vet. Sci., College of Agric., WIS	January, 1960
Donald L. Piermattei	A Comparison of Nitrofurantoin and Dihydrostreptomycin in the Treatment of Experimental Feline Escherichia coli Urocystitis	Dept. of Surg. and Med., MSU	June, 1960
Edwin I. Pilchard, Jr.	Activity of Normal and Immune Turkey Sera on Fowlpox Virus	ILL	October, 1959
John Paul Rapp	A Study of Growth Requirements and Effects of Hormones and Vitamin A on Bovine Teat Canal in Organ Culture	Dept. of Path. and Bact., COR	September, 1959
Vonthebettu Ravivarma Hedge	A Study of the Effects of Dehydration on Blood Urea Nitrogen in the Canine	Dept. of Surg. and Med., KSU	January, 1960
Winthrop C. Ray	A Study of the Factors Influencing Persistent Brucella Infections in Wisconsin Dairy Herds	Dept. of Vet. Sci., College of Agric., WIS	May, 1960
Charles Feder Reid	Radiation Therapy in the Horse	Dept. of Physiol., COR	June, 1960
John H. Richardson	Effects of an Ion Resin Artificial Kidney in Dogs	Dept. of Surg. and Med., MSU	June, 1960
William M. Romane	Circumcision of the Bull	Dept. of Med. and Surg., TEX	August, 1960
Wilhelm F. Schaeffler	Experimental Infestation of Sheep with Dog Ascarid Toxocara canis	ILL	August, 1959
Herbert F. Schryver	Bone Marrow of the Normal Cat	Pathology Dept., UP	June, 1960
Robert P. Shields	A Comparison of Serum and Bone Alkaline Phosphatase Activity of Normal Dogs to that of Dogs with Hypertrophic Pulmonary Osteoarthropathy	Dept. of Physiol. and Pharmacol., AUB	August, 1959
Lajhbir Singh	Studies on Coliform Group of Organisms in Poultry	Dept. of Vet. Sci., VPI	June, 1960
Moeljohardjo Djoko Soedarmo	Observations on the Absorption of Sugars in the Crop of the Fowl	Dept. of Physiol., COR	September, 1959
Soeratan	The Susceptibility of Ducks to Infection with Leptospira pomona and Preliminary Studies on Their Role as Carriers of Leptospirae	Dept. of Surg. and Med., KSU	September, 1959
Maharajapuram Subramania Ganapathy	A Study of the Effects of Acutalyn R/ on the Experimentally Induced Uremia in Canines	Dept. of Surg. and Med., KSU	January, 1960
Robert N. Swanson	Evaluation of an Erythropoietic Factor Obtained from Blood of Experimentally Induced Anemic Cattle Using Radioactive Fe ⁵⁹	Dept. of Physiol., KSU	January, 1960
Amir Hussain Talukder	A Description of a Paraventricular and Supraoptic Nuclei of the Bovine Hypothalamus	Dept. of Anat., TEX	August, 1960
Hok Seng Tan	Bovine Genital Vibriosis	Dept. of Med. and Obstet., COR	September, 1959
Clarence A. Tervola	A Study of Problems in the Diagnosis of Mycobacterium bovis Infection in Cattle	Dept. of Vet. Sci., College of Agric., WIS	May, 1960
Karkala Trivikrama Rao	A Histological Study of the Oviduct of the Immature, Mature, and Pregnant Bovine	Dept. of Anat., KSU	January, 1960
Frank D. Wilson	A Study of the Various Approaches of Thoracotomy in Canines	Dept. of Surg. and Med., KSU	January, 1960
Arian Zarkower	The Effect of Drugs on Plasma Enzyme Levels, Hematology and Pathology of Chickens	Dept. of Anim. Path., U. of Maine	June, 1960

AWARDED DOCTOR OF PHILOSOPHY (Ph.D.) DEGREE

Name of student	Title of thesis	Dept. and School	Date granted
John M. Bowen	Effects of Insulin on Gastrointestinal Motility in the Sheep	Dept. of Physiol., COR	June, 1960
Walter C. Bowie	In Vitro Studies of Rumen Microorganisms Using a Continuous-Flow System	Dept. of Physiol., COR	February, 1960
Harold E. Dziuk	Physiological Studies of Some Chemical Factors in Legumes as Related to Motor Functions of the Ruminant Stomach	MIN	March, 1960
Billy B. Hancock	Cytopathology of Virus Infected Kidney Cell Cultures of Swine	Dept. of Bact., OSU	June, 1960
Lars H. Karstad	Studies on the Epizootiology of Eastern Equine Encephalomyelitis	Dept. of Vet. Sci., College of Agric., WIS	January, 1960
Peter H. Langer	The Effects of Infectious Bovine Rhinotracheitis-Infectious Pustular Vulvovaginitis (IVR-IPV) Virus on Newborn Calves from Immune and Non-Immune Dams	Dept. of Path. and Bact., COR	June, 1960
Leo Gilles Mathieu	Investigations on the Phosphorous Requirement of Growing Rabbits	Degree completed in Dept. of Agric., COR	June, 1960
Krishna N. Mehra	The Amino Acid Composition of Trichomonad Protozoa	ILL	June, 1960
Thomas E. Murchison	Physical, Chemical, and Immunological Properties of Tetrazotized Serum Proteins	Dept. of Vet. Path., OSU	December, 1960
Yoshihiro Ozawa	Some Properties of Infectious Bronchitis Virus Propagated in Isolated Chorioallantoic Membrane	Dept. of Microbiol., MSU	December, 1959
Eugene Papp	Effect of Thymectomy in Rats and Calves	Dept. of Vet. Anat., OSU	March, 1960
Ayusa Pichaicharnarong	A Study of Climatic Effects on the Cardiovascular System, Respiratory System, and Body Temperature of Cattle	Dept. of Physiol., COR	June, 1960
Maxwell S. Redfean	An Immunochemical Study of Antigens of Brucella Extracted by the Westphal Technique	Dept. of Vet. Sci., Dept. of Med. Microbiol., WIS	June, 1960
Indra P. Singh	Some Properties of Infectious Bronchitis Virus as Determined by Thermal and Formalin Inactivation	Dept. of Microbiol., MSU	June, 1960
John P. Sullivan	Studies on Progesterone Metabolism of Normal Dairy Cows	MIN	July, 1960
Allan L. Trapp	Pathology of the Blood-Vascular and Lymphatic Systems of Cattle Affected with Mucosal Disease	Dept. of Vet. Path., ISU	July, 1960
Charles E. Whiteman	Histopathology of the Adrenal Cortex and Adenohypophysis in Cattle with Mucosal Disease	Dept. of Vet. Path., ISU	February, 1960
Robert W. Wichmann	A Study of the Characteristics of an Infectious Agent Causing Synovitis in Chickens	Dept. of Com. Path., CAL	January, 1960
Donald A. Willigan	Studies on the Distribution and Excretion of Cobalt 60-Vitamin ₁₂ in the Dog and Rat	MINN	July, 1960
Vance J. Yates	Characterization of the Chicken-Embryo-Lethalorphan (CELO) Virus	Dept. of Vet. Sci., Dept. of Med. Microbiol., WIS	June, 1960

AWARDED MASTER OF PUBLIC HEALTH DEGREE

Name of Student	Title of thesis	Dept. and School	Date graduated
Paul Arnstein	.....	U. of California	June, 1960
Jerry D. Barak	The Transmission of Rocky Mountain Spotted Fever	Dept. of Trop. Med. and Pub. Health, Tulane	May, 1960
George E. Bowler	.....	U. of Michigan	June, 1960
James C. Brown	Larva Migrans in Man	U. of North Carolina	.....
James Cocozza	.....	U. of California	June, 1960
Daniel Cohen	.....	U. of Pittsburgh	June, 1960
Farouk F. Faragalla	Master of Science in Hygiene in the Field of Nutrition	Harvard	June, 1960
William T. Gerard	Epidemiology of Tularemia	Dept. of Trop. Med. and Pub. Health, Tulane	May, 1960

AWARDED MASTER OF PUBLIC HEALTH DEGREE—Cont'd.

Name of Student	Title of thesis	Dept. and School	Date granted
Olen Givens	U. of California	June, 1960
William T. Hubbert	U. of Minnesota	January, 1959
Antonia V. Jacalne	U. of Pittsburgh	June, 1960
T. Timothy Kuhlmann	U. of Michigan	June, 1959
Paul D. Lambert	Johns Hopkins U.	June, 1960
Leon Lanoix	U. of Montreal	.....
William G. Lord	U. of Pittsburgh	June, 1960
John R. Mitchell	U. of Michigan	June, 1960
J. P. Morin	U. of Montreal	.....
George A. Mullen, Jr.	Consideration of the Risk of Human Infection with Ornithosis Virus	Dept. of Trop. Med. and Pub. Health, Tulane	May, 1960
John P. Newman	U. of Minnesota	March, 1960
Orin H. Osborn	U. of Minnesota	March, 1960
John W. Richardson	U. of Michigan	June, 1960
Jack T. Tumlin	U. of Minnesota	January, 1960
Claude G. Wilkes	Echinococcus Infections in Man and Animals	U. of North Carolina	.....
Joe T. Williams	U. of Michigan	June, 1960
Richard W. Winters	Epidemiology of Toxoplasmosis	Dept. of Trop. Med. and Pub. Health, Tulane	May, 1960
David Wise	U. of Pittsburgh	June, 1960
Juan A. Zapatel	U. of Minnesota	January, 1960

The areas filled by a dash indicate that there was no thesis required for the attainment of a degree or the information was not supplied.

Among the States and Provinces

California

MIDWINTER CONFERENCE PLANNED.—The Midwinter Conference of the California V.-M.A. is scheduled for January 30, 31, and February 1 at the School of Veterinary Medicine, University of California, Davis.

Programs have been arranged for large and small animal practitioners as well as regulatory veterinarians. A program for the Western Poultry Disease Conference will also be given.

Some of the speakers slated for the large and small animal sessions are Dr. Douglas Blood, Ontario Veterinary College; Dr. J. E. Mosier, Kansas State University, and Dr. William V. Lumb, Colorado State University.

Official meeting headquarters will be in the Sacramento Inn, Sacramento.

TRAINING PROGRAM IN LABORATORY ANIMAL MEDICINE PRESENTED BY UNIVERSITY OF CALIFORNIA.—A training program in laboratory animal medicine and physiology has been established at the University of California School of Medicine, Los Angeles. A \$6,000 per year stipend has been granted.

Apprentice training will be included, and students may work toward their M.S. and Ph.D. degrees. They will participate directly in operating animal colonies on the U.C.L.A. campus. Attendance at meetings concerned with laboratory animal care will be a requirement of the program.

Applicants should submit a transcript of their veterinary school and college record, 2 or 3 letters of recommendation, and a personal letter explaining their professional interest in laboratory animal medicine. Second and third year students are invited to apply for summer training in the field at U.C.L.A.

Inquiries should be addressed to Dr. Bennett J. Cohen, Office of Animal Care, U.C.L.A. Medical Center, Los Angeles 24, Calif.

Florida

SOUTH FLORIDA V.M.A. ELECTS OFFICERS, STRIVES TO BETTER VETERINARIAN-HUMANE SOCIETY RELATIONS.—New officers elected to serve the South Florida V.M.A. for 1960-1961 are: Drs. J. O'Quinn (GA '53), Hialeah, president; Harry Bice (OSU '44), Opa Locka, president-elect; Clyde Chandler (MO '55), Miami, treasurer; and G. E. Lanier (AUB '56), Miami, secretary.

A major goal of the association for the coming year will be to better relations with the local humane society. To help form a better liaison between the two groups, the president and two board members of the humane society were invited to attend the November meeting of the veterinary society and discuss problems of mutual interest.

The association will draw on state and local medical and veterinary medical talent in planning its educational program for the coming year.

Georgia

VETERINARIAN ELECTED TO STATE LEGISLATURE.—Dr. J. Roland Clanton (AUB '43), Thomasville, will serve as a senator from the Seventh Senatorial District of Georgia in the 1961 Georgia Legislature.

Dr. Clanton is a past-president of the Georgia V.M.A. and is now a director of the association.

Illinois

MISSISSIPPI VALLEY V.M.A. ELECTS NEW OFFICERS.—New officers of the Mississippi Valley V.M.A. elected at the association's 56th annual meeting in Peoria are Drs. W.

P. Hendren (ILL '52), Carthage, president; Roger A. Grant (COL '48), Wyoming, president-elect; and R. C. Williams (ISU '49), Moline, secretary-treasurer.

The 146 veterinarians attending the sessions heard AVMA Vice-President Dr. C. M. Rodgers, Blandinsville, speak on healthy feedlot cattle. Another special visitor to the meeting was Illinois State V.M.A. President Dr. W. G. Raudabaugh, Piper City.

National Women's Auxiliary President Mrs. E. E. Leasure attended the meeting of the 70 veterinarians' wives at the convention. Mrs. E. C. Hannan, Illinois State Women's Auxiliary president, also attended.

• • •

SWINE REPOPULATION ALSO DISCUSSED AT MISSISSIPPI VALLEY MEETING.—A highlight of the Mississippi Valley V.M.A. meeting was a discussion of swine repopulation by Drs. R. B. Koger (KSU '41), Joplin, Mo.; Joseph W. Albrecht (ISU '43), Princeton, Ill.; Arthur L. Starkey (MSU '42), McLean, Ill.; Marvin Clark (ISU '52), Monmouth, Ill.; Ralph F. Hall (ILL '54), LaHarpe, Ill.; and R. E. Swinderman (OSU '45), Kewanee, Ill.

During the discussion it was stated that swine repopulation is aimed at eliminating contacts with viruses transmitted by recovered carrier animals. The specific pathogen-free plan, geared primarily at eliminating virus pig pneumonia and atrophic rhinitis, also may help eliminate transmissible gastroenteritis, brucellosis, leptospirosis, pleuropneumonia, internal and external parasites, and specific and nonspecific bacterial enteric infections.

They said a successful swine producer having specific pathogen-free pigs must work closely with his veterinarian in maintaining superior sanitation and management programs.



Discussing swine repopulation at the Mississippi Valley V.M.A. meeting are: (left to right) Drs. R. B. Koger, J. W. Albrecht, A. L. Starkey, M. Clark, R. F. Hall, and R. E. Swinderman.

It was agreed that sanitation, isolation, and nutritional practices must be carefully supervised and that secondary complications such as bacterial diarrhea must be controlled while the animals adjust to the stress and bacterial flora of the new environment after being removed from their germ-free living conditions.

The group brought out the fact that research is now under way in Canada to compare three methods of obtaining specific pathogen-free pigs: by hysterectomy, by cesarean section, and by using sterile plastic bags

Kansas

KANSAS STATE UNIVERSITY GIVES BORDEN AWARD.—The Borden award of the Kansas State University School of Veterinary Medicine for 1960 has been presented to Russel O. Bieri, Fargo, N. D.

Mr. Bieri received a certificate of merit and a check for \$300.

The scholarship is given each year to the veterinary senior who has achieved the highest grade point average in his first six semesters in the professional veterinary medicine curriculum. Mr. Bieri has an average of 3.568, (B=3.0, A=4.0).

Runners-up to Bieri were Art J. Quinn, Bennington, Kan., and John D. Olsen, Brigham City, Utah.

Maryland

MARYLAND STATE V.M.A. EXHIBIT VIEWED BY 275,000.—The Maryland State V.M.A.'s new exhibit, finished less than 3 months ago, already has been viewed by an estimated 275,000 persons.

The exhibit, entitled "You, Veterinarian and You," emphasizes the importance of veterinary medicine to public health. It contains 16 large photographs depicting various services of the veterinarian in large and small animal practices. A rack provides space for pamphlets and booklets for public distribution. The association estimates that more than 40,000 pieces of literature have been distributed to persons who stopped to look at the display.

The exhibit was first shown at the Mary-

land State Fair, before an estimated 150,000 persons, and since has appeared at various county fairs throughout the state. Its latest booking was at the Eastern National Livestock Show, at Timonium, Md., fourth largest livestock show in the nation.

Minnesota

DR. J. G. FLINT APPOINTED EXECUTIVE OFFICER, MINNESOTA STATE LIVESTOCK SANITARY BOARD.—Dr. Jack G. Flint (COR '44), St. Paul, took office as secretary and executive officer of the Minnesota State Livestock Sanitary Board on Jan. 1, 1960.

Immediately following graduation from Cornell, Dr. Flint set up a general practice in Waterford, Wis. In 1949 he moved his practice to Fairbault, Minn., and maintained it there until 1956.



Dr. Jack G. Flint

He was first employed by the Minnesota State Livestock Sanitary Board on April 1, 1956, and on July 1, 1958, was appointed assistant secretary.

Dr. Flint is a member of the AVMA, the United States Livestock Sanitary Association, and the Minnesota and Twin City Veterinary Medical Associations.

Ohio

OHIO VETERINARIAN IS A PUBLIC RELATIONS ISSUE IN NOVEMBER.—The November issue of

the *Ohio Veterinarian* was completely devoted to the veterinary public relations. It was prepared and edited by the Public Relations Committee of the Ohio State V.M.A.

"Why a Public Relations Issue?" is the first question raised in the publication. The Public Relations Committee explains that "Public relations is every veterinarian's job—all the time. . . . Sometimes we overlook the importance of such things as a warm smile, a pleasant phone voice, competent help, and a tidy office. . . . Your committee has embarked upon a 'grass roots' P.R. program. We thought it wise to exert most of our efforts in the beginning on our own membership. We wish to make you public relations conscious and herewith provide you with some aids and ideas to make your part in this necessary program an easier one."

Some subjects discussed in the publication are community relations, press, radio, and television participation, scheduling appointments to avoid conflict, proper use of the telephone, public relations importance veterinary medical assistants, awards and exhibits, and veterinary fees.

Pennsylvania

BRANDYWINE VALLEY V.M.A. ELECTS NEW OFFICERS.—Dr. Harry Gray, Chadds Ford, Pa., has been elected president of the Brandywine Valley V.M.A.

Other newly-elected officers are: Drs. John R. Francella (UP '37), Coatesville, vice-president; Harvey C. Waltz (UP '49), West Chester, secretary; and John H. Cowan (UP '48), Coatesville, treasurer.

Dr. J. Allyn Rogers (UP '26), Bryn Mawr, and Dr. Maurice Arnold (UP '43), Kennett Square, have been elected delegate and alternate delegate respectively to the next AVMA convention in Detroit next August.

Wyoming

VETERINARIANS ACTIVE IN STATE-WIDE COMMUNITY WORK.—On election day, the ballots in Wyoming carried the names of two veterinarians.

One of them, Dr. Peter E. Madsen (COL '31), Sheridan, was elected senator from

Sheridan County to the Wyoming legislature. Dr. Madsen had previously served two terms in the Wyoming House of Representatives.

The other veterinarian on Wyoming election ballots was Dr. Adrian Weaver (COL '52), Laramie. Also a candidate for the state legislature, Dr. Weaver was defeated by strong party opposition.

Another community-minded veterinarian, Dr. J. E. Ketcham (COL '40), Cheyenne, was elected president of the Wyoming Crippled Children's Society.

• • •

VETERINARIAN COMMENDED FOR SCABIES WORK.—Dr. R. F. Noah (COL '37), River-ton, Wyo., was cited for his work on the sheep scabies and scrapie eradication program by the Agricultural Research Service, USDA. Dr. Noah received a check from ARS and letters of commendation from Drs. Anderson and Shaw of the ARS, and from Dr. L. H. Smith, ARS supervisor of the state. The citation was made at the meeting of the Wyoming V.M.A. at Casper, Oct. 16.

Veterinary Military News

Veterinary Scientist to Work on Nuclear Energy

Major James B. Young (TEX '43), an Army Veterinary Corps nuclear scientist, has been assigned to the Division of Nuclear Energy of the Research and Development Command.

He was transferred from the Walter Reed Army Institute of Research to assist in the over-all staff administration of research on medical aspects of nuclear energy.

Major Young entered the Army in 1944 to serve in the CBI during World War II. After the war, he worked on foot-and-mouth disease eradication in Mexico under the auspices of the USDA. He was recalled to active duty in 1948.

During a tour of duty with the U.S. Armed Forces in Austria from 1951-1954, he helped establish approved local milk supplies in Austria and Italy.

From 1954 to 1957, Major Young taught at the U.S. Army Medical Service Meat and Dairy Hygiene School, Chicago, and then took the Advance Course for Army Medical officers at Brooke Army Medical Center. He earned his Master's Degree in radiation biology at the University of Rochester and attended the Army's Command and General Staff College associate course and the Nuclear Weapons Employment course.

Major Young is an AVMA member.



Colonel Robert H. Yager (UP '39) became director, Division of Veterinary Medicine, Walter Reed Army Institute of Research, Walter Reed Army Medical Center, Washington, D.C., upon the retirement of Colonel M. B. Starnes (TEX '27) Sept. 30, 1960. Colonel Yager had formerly directed the division from 1949 to 1954.

State Board Examinations

ARIZONA—Jan. 18-19, 1961, University of Arizona, Tucson, Ariz. Dr. William E. Snodgrass, Secretary, Route 2, Box 373, Glendale, Ariz.

NEW MEXICO—Jan. 20-21, 1961, Santa Fe, N. M. Dr. Edwin J. Smith, Box 4385, Santa Fe, N.M., secretary.

NORTH CAROLINA—Jan. 26-27, 1961, Carolina Hotel, Raleigh, North Carolina. Dr. James I. Cornwell, secretary, P.O. Box 9038, Asheville, N.C.

TEXAS—Jan. 28-29, 1961, Rice Hotel, Houston, Texas. Applications must be received 30 days before examination. Dr. T. D. Weaver, Executive Secretary, 207 Capital National Bank Building, Austin 16, Texas.

Deaths

Star indicates member of AVMA

W. Clyde Drake (KSU '13), San Gabriel, Calif., died June 9, 1960.

George J. Rife (KSU '16), 73, Liberty, Mo., died Sept. 22, 1960, at Fort Leavenworth, Kan.

Colonel Rife entered the Army Veterinary Corps in July, 1917, and served continuously until he retired in August, 1946.

Vincent M. Ruth (ONT '13), 74, Franconia, Pa., died Aug. 23, 1960, from a heart attack he suffered while bowling.

Dr. Ruth had maintained a general practice for nearly 50 years at Franconia.

★Charles T. Singletary (TEX '47), 32, Morgan City, La., died Oct. 1, 1960, following a heart attack that occurred the same day.

Dr. Singletary had been maintaining a small animal practice in Morgan City since March, 1960, when he retired from the Army after six years of service.

Ira C. Turpen (KVC '14), 79, North Platte, Neb., died Jan. 31, 1960. Dr. Turpen had never recovered fully from injuries sustained in an automobile accident in December, 1949.

He had maintained a general practice in North Platte for many years.

John M. Vernon (CVC '08), 89, Des Moines, Iowa, died Sept. 18, 1960, of a cerebral hemorrhage.

Dr. Vernon had been a prominent equine practitioner. He was a life member of the Iowa V.M.A. and a member of the Central Iowa V.M.A.

S. B. Watson (KCV '12) died Aug. 9, 1960, at Wayland, Iowa.

Women's Auxiliary

Women's Auxiliary to the Southern V.M.A. Meets

Women representing the states of Alabama, Florida, Georgia, Kentucky, Maryland, North Carolina, South Carolina, Tennessee, and Virginia gathered at the Francis-Marion Hotel, Charleston, S.C., for the 1960 meeting of the Women's Auxiliary to the Southern V.M.A., October 24.

Three officers of the national Auxiliary were present for the meeting. They were Mrs. E. E. Leasure, president; Mrs. J. I. Cornwell, vice-president for the House of Delegates; and Mrs. P. S. Roy, treasurer. Mrs. Cornwell and Mrs. Roy are members of the Southern V.M.A. Women's Auxiliary.

Mrs. Leasure presented a simulated panel television program during the meeting. On the panel were Mrs. Roy, who spoke about the AVMA Research Fund, and Mrs. Corn-

well, who discussed the publication of the proceedings from the Denver meeting.

The auxiliary voted to donate \$25 to the AVMA Research Fund, \$15 to the AVMA Auxiliary Loan Fund, and \$10 to the Texas A. & M. College Library Fund.

Officers elected at the meeting are Mrs. E. E. Chambers, Tennessee, president; Mrs. T. S. Maddox, Kentucky, president-elect; Mrs. F. E. Wilhite, Georgia, first vice-president; Mrs. J. T. Dixon, North Carolina, second vice-president; Mrs. M. P. Sause, Maryland, secretary; and Mrs. M. R. Blackstock, South Carolina, treasurer.

Member groups of the Women's Auxiliary to the Southern V.M.A. not represented at the meeting are Arkansas, Louisiana, Mississippi, Oklahoma, Texas, West Virginia, and Washington, D.C.

Mississippi Valley Women's Auxiliary Meets

Special guests at the 23rd annual meeting of the Women's Auxiliary to the Mississippi Valley V.M.A. November 2-3 in Peoria, Ill., were Mrs. E. E. Leasure, president, and Mrs. C. M. Rodgers, president-elect of the Women's Auxiliary to the AVMA.

Mrs. Leasure of Manhattan, Kan., spoke briefly to the group about the Auxiliary Student Loan Fund. Mrs. Rodgers is from Blandinsville, Ill.

New officers elected by the auxiliary at their meeting are: Mrs. W. L. Beer, Aledo, Ill., president; Mrs. R. A. Latham, Erie, Ill., president-elect; Mrs. G. F. Fehrenbacher,

Wyoming, Ill., secretary-treasurer; and Mrs. R. C. Williams, Moline, Ill., delegate to the Women's Auxiliary to the AVMA convention.

Mrs. G. I. Case, Kewanee, Ill., reported on the rapid communications telephone system that has been operating in the association for the past year. The system was set up so that emergency information could more quickly be disseminated to the membership.

Also attending the meeting were Mrs. E. C. Hannan, president, and Mrs. M. E. Davenport, membership secretary, of the Illinois State V.M.A. Auxiliary.

BENYLIN[®] **EXPECTORANT** *for cough relief*



**ANTIHISTAMINIC
DECONGESTANT
ANTISPASMODIC**

Benylin Expectorant is a combination of approved medical agents which assist in liquefying and removing mucous secretions from the respiratory tract.

**USEFUL IN ALL COUGHS AND OTHER
SYMPTOMS OF CONGESTION ASSOCIATED
WITH THE RESPIRATORY SYSTEM**

**Benylin Expectorant is available in
16-ounce and 1-gallon bottles.**

Not recommended for use in animals
supplying milk for human consumption.

Complete information available on request.

PARKE-DAVIS

**PARKE, DAVIS & COMPANY
DETROIT 32, MICHIGAN**

**PARKE, DAVIS & COMPANY, LTD.
MONTREAL 9, QUEBEC**

208-1160

for retained placenta

FUREA[®] bolus veterinary



FUREA effectively combats the dangers that arise in bovine retained placenta by a 2-way action:

- 1) *bactericidal*, even in the presence of pus, blood and serum, and 2) *proteolytic* for resolving necrotic tissue.

Clinical usage produced a rapid decrease in signs of infection, reduction or elimination of malodor, and unimpaired fertility in over 90% of treated cows.

FUREA is an intrauterine bolus containing FURACIN[®] (brand of nitrofurazone) 0.12 Gm. and urea 12 Gm. The bolus disintegrates swiftly in uterine fluids, providing rapid and uniform distribution of active ingredients to the affected tissues. It is nonirritating and nontoxic.

Dosage: Two boluses inserted into the recently pregnant horn. One bolus may be placed in the nonpregnant horn. Repeat at 24-hour intervals, as necessary.

Supplied: Bottle of 25 boluses.

1. Jones, S. V.; Belloff, G. B., and Roberts, H. D. B.: Vet. Med. 51:413 (Sept.) 1956.

Available through your professional veterinary distributor

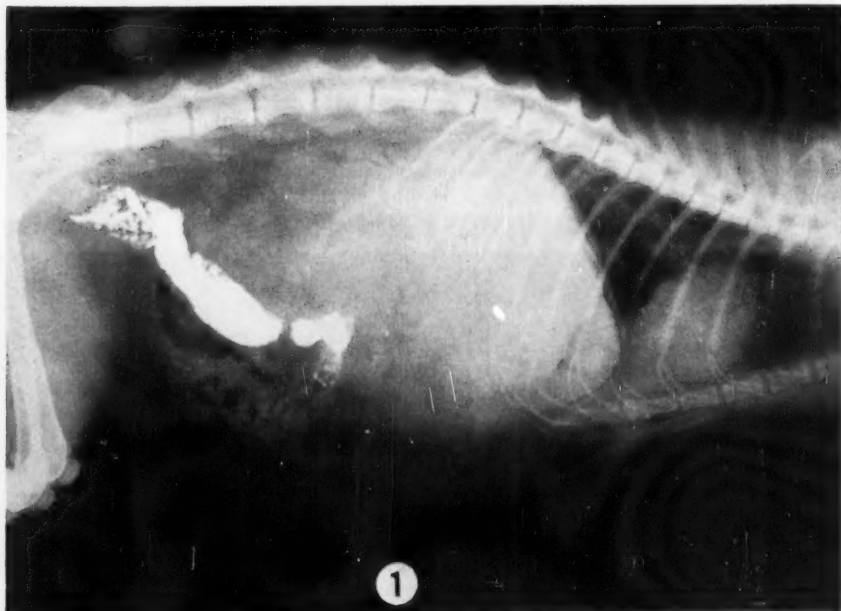
EATON LABORATORIES
Division of The Norwich Pharmacal Company
NORWICH, NEW YORK



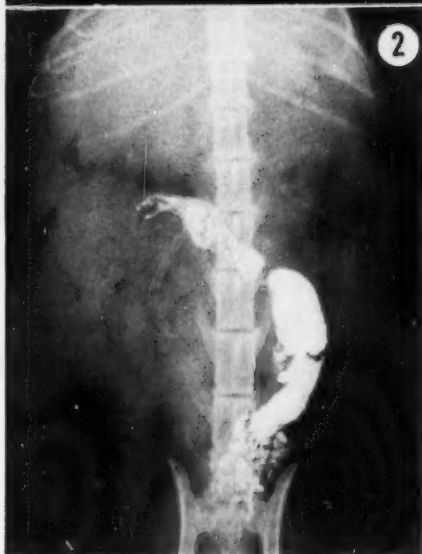
*prevention of
uterine infection —
early restoration of
fertility in over 90%
of treated cows¹*

WHAT IS YOUR *Diagnosis?*

Make your diagnosis from the picture below—then turn the page ▶



1



2

Fig. 1—Lateral radiograph of thorax and abdomen of the cat.

Fig. 2—Ventrodorsal radiograph of abdomen.

History.—A male cat, 14 years old, had lost considerable weight during the previous two months. A mass could be palpated in the abdomen in the region of the liver. Lateral and ventrodorsal radiographs (fig. 1 and 2) were taken after the administration of barium meal.

This case report was submitted by First Lt. John F. Ferrell, Pathology Division, U.S. Army Medical Research and Nutrition Laboratory, Fitzsimons General Hospital, Denver 30, Colo., Charles H. Garvin, V.M.D., Aurora, Colo., and Major Edward Dean, Radioisotope Branch, U.S. Army Medical Research and Nutrition Laboratory, Fitzsimons General Hospital, Denver.

Here Is the Diagnosis

(Continued from preceding page)

Diagnosis.—Tumor mass adjacent to or attached to the liver. Calcification of the mesenteric vessels.

Comment.—The radiographs show an area which is highly suggestive of a tumor mass (fig. 3). More interesting are the tapeworm-like structures which actually represent the calcification present in the mesenteric vessels (fig. 3).

An exploratory laparotomy revealed a tumor of the pancreas, with metastases to the liver, spleen, and mesentery.

At necropsy, the tumors observed at the time of the laparotomy were more readily observed (fig. 4). The mesenteric vessels were found to be hard and were difficult to incise. There were a number of plaques in the aorta near the base of the heart.

Further histopathologic examination revealed the neoplasm to be an adenocarcinoma of the pancreas (fig. 5), with metastases to the liver, spleen, and mesentery. Arteriosclerosis was characterized by calcifications in the heart, aorta, and mesenteric vessels.

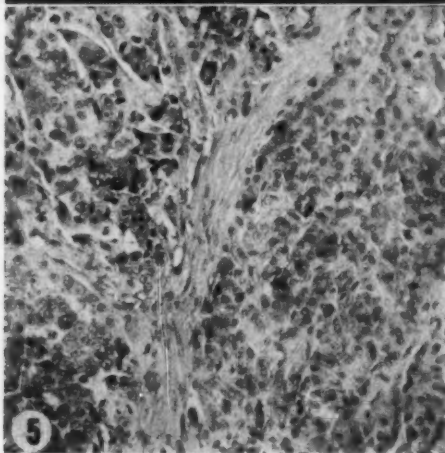
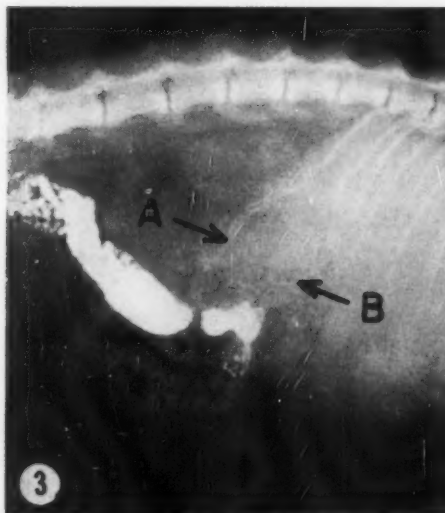


Fig. 3—Lateral radiograph of the cat's abdomen showing calcified mesenteric vessels (A) and an area suggestive of a tumor mass (B).

Fig. 4—Opened abdomen of cat showing tumor masses of liver, mesentery, and pancreas.

Fig. 5—Photomicrograph of pancreas; neoplastic tissue on left and normal tissue on right.

FOR CALF SCOURS

ENTEUFUR®

BOLUS VETERINARY, SMALL

COMBINES

FURAMAZONE (1 Gm.)—for specific antibacterial activity against gram-negative and gram-positive enteric bacteria

BISMUTH SUBSALICYLATE (0.26 Gm.)—for astringent, antidiarrheal activity, and as a protective to the lining of the gastrointestinal tract

TO PROVIDE

"UNIFORMLY EXCELLENT RESULTS..."

Bull, W. S.: N. Am. Vet. 38:3 (Jan.) 1957.

Dosage: 1 bolus perorally, twice daily, for 2 or 3 days.

Supplied: Boluses of 3.3 Gm. each, in boxes of 24 and 500.

EATON LABORATORIES

Division of The Norwich Pharmacal Company

NORWICH, NEW YORK



new



NEW Erythrocin®

INJECTABLE VETERINARY

for large animals...for small animals...for poultry

Erythrocin Injectable Veterinary is a safe, fast-acting antibiotic with a wide range of indications in both large and small animals.

Fast Blood Levels

Erythrocin Injectable administered at therapeutic dosage will provide peak blood levels in one to two hours, with effective concentration remaining in the system for several hours.

Effective against "Resistant" Strains

Studies have shown Erythrocin Injectable effective against staph, strep, and pneumococci—including some strains which have become resistant to the action of other antibiotics.

Safe

Erythrocin has an unparalleled record of safety in use in human medicine. Clinical trials on over 1900 large and small animals indicate that Erythrocin Injectable Veterinary also has a high order of safety. In addition, there are seldom complications with Erythrocin therapy and little likelihood of resistance developing during, or as a result of, treatment.

*Erythrocin—Erythromycin, Abbott

Bactericidal against some Common Invaders

Erythrocin is classified as bactericidal, against certain coccal organisms. This means prompt clinical results for your patients.

Many indications in Veterinary Practice

Some typical large and small animal conditions for which Erythrocin may be successfully used, include: pneumonia, upper respiratory infections, "shipping fever", mastitis, metritis, "foot rot", wound infections, pleurisy, "lamb dysentery", secondary infections (as in canine distemper), and as an aid in the management of leptospirosis in sows at farrowing and of some "scours" in young pigs.

Available in two Sizes

Erythrocin Injectable Veterinary (List No. 8589) comes in 250 and 100 ml. bottles. It is stable at normal room temperature and retains its potency indefinitely.



New Motion Picture Films Available

Fallout and Agriculture

16 mm. Sound	Color; Running time 23 min.	USDA ARS	\$2.00
-----------------	-----------------------------------	-------------	--------

This film provides information on radioactive fallout and its movement through the atmosphere resulting in the exposure of man and animals to radiation and the contamination of agricultural commodities. It discusses the radioactive elements that are of concern to agriculture and can contaminate our crops and food supply. Means of protecting against radiation and minimizing the contamination of soil, crops, and other foods are discussed and illustrated. This film is useful and interesting in discussing the problem of radioactive fallout and its effects on the farm.

This film is recommended for veterinary students, agricultural groups, 4 H and FFA, service clubs, and civic organizations.

Leptospirosis in Animals

16 mm. Sound	Color: Running time 9½ min.	Produced by College of Vet. Med. Univ. of Illinois Abbott Laboratories	\$1.50
-----------------	-----------------------------------	---	--------

This is an excellent teaching film. There is a general discussion of the various species of *Leptospira* and the symptomology in cattle and swine. Procedures for culturing and the serologic testing for leptospirosis is described. Reference is made to the public health significance.

This film is recommended for students of veterinary medicine.

Ticks and Tick-Borne Diseases

16 mm. Sound	Color: Running time 19 min.	Produced by Communicable Disease Center, U.S.P.H.S.	Rental \$2.00
-----------------	-----------------------------------	---	------------------

Ticks play an important role in the transmission of certain diseases affecting animals and man. While this film does not deal specifically with tick-borne diseases of livestock, it is an excellent teaching film for the morphologic characteristics and geographic distribution of ticks in the United States. Symptoms of Rocky Mountain Spotted Fever and Colorado Tick Fever in man are shown. Protective procedures and control methods are mentioned.

This film is recommended for professional and lay audiences, particularly students of veterinary medicine.

This film is cleared for television.

Leptospirosis

16 mm. Sound	Color: Running time 16½ min.	Produced by Communicable Disease Center, U.S.P.H.S.	Rental \$2.00
-----------------	------------------------------------	---	------------------

This film acquaints the veterinarian, student of veterinary medicine, and others with the transmission, clinical manifestations, laboratory diagnosis, therapy, and control of leptospirosis.

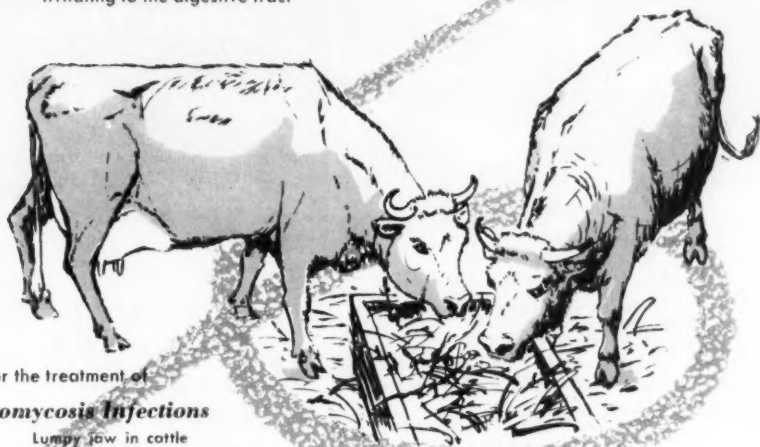
Emphasis is placed on the relationship of this disease between man and animals. Occupational sources and clinical symptoms in man, as well as clinical manifestations in animals, are mentioned. Serologic and cultural testing procedures are described.

This film is cleared for television and is recommended for both professional and lay audiences, particularly for students in veterinary medicine.

dependable!

HYDRODINE

a very palatable, organically bound iodide. When fed at the recommended levels HYDRODINE is safe and non-irritating to the digestive tract



For the treatment of

- **Actinomycosis Infections**

Lumpy jaw in cattle
Fistulous withers in horses

- **Actinobacillosis**

- **Infectious Pododermatitis**

(Foot Rot)

- **Thyroid dysfunction**

- **Chronic coughing**

also as adjunctive therapy in the correction of sterility, mastitis and chronic iodine deficiencies. When fed at low levels Hydrodine will help prevent the occurrence of foot rot.



Corn Belt Laboratories, inc.

producers of biologicals and pharmaceuticals
for the graduate Veterinarian exclusively

EAST ST. LOUIS, ILL. and convenient depots
Tel. UPTon 4-3333





DEHYDRATION ?
MALNUTRITION ?
DEBILITATION ?
TISSUE DÉPLETION ?

NEW

for large animals for small animals

ARLIVITE®

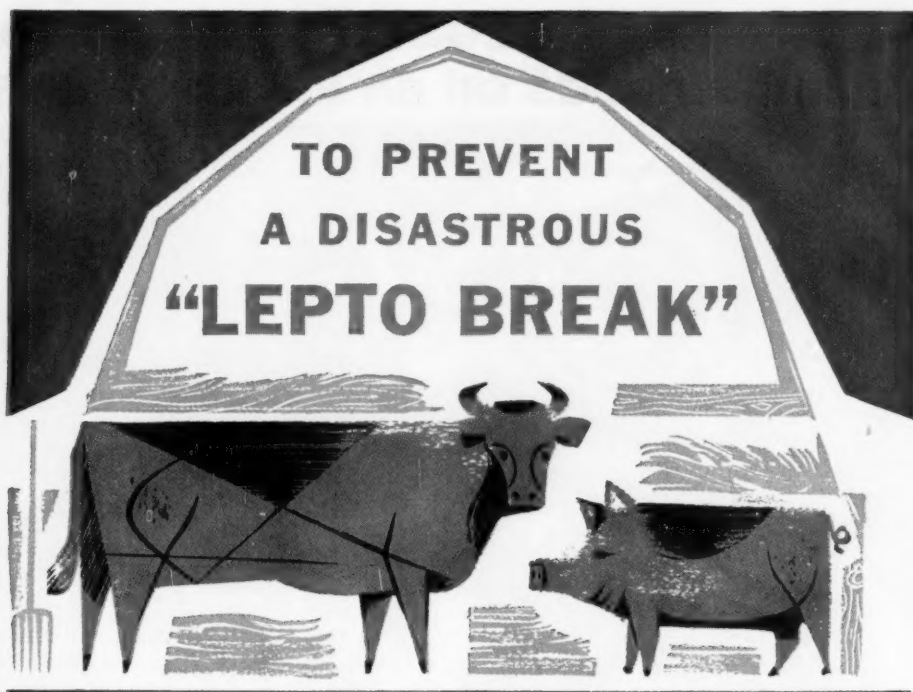
parenteral amino acids, glucose, B vitamins

- Replaces lost fluid volume in dehydrated animals
- Combats debilitating effects of diarrhea, distemper, dystocia, enteritis, mastitis, parasitism
- Corrects hypoglycemia, provides energy, prevents diversion of protein for caloric needs
- Provides immediately available amino acids for rapid repair of depleted tissue
- Replenishes body stores of B vitamins, restores appetite
- Corrects suboptimal performance due to low serum protein levels

Indicated as part of the treatment of disease, before and after surgery, and whenever the state of nutrition appears poor. Available in individual 250 cc. bottles as a desiccated powder to be reconstituted with sterile water, normal saline, additional glucose or fructose solution.

VETERINARY DEPARTMENT • ARMOUR PHARMACEUTICAL COMPANY
©1960, A.P. Co. KANKAKEE, ILLINOIS





vaccinate with new

L-povac[®]

Leptospira pomona bacterin ARMOUR

Protects against deaths, abortions, milk and meat production losses, due to leptospirosis in swine and cattle.

- stimulates active immunity
 - controls spread of leptospirosis
- a killed pure whole culture.....no danger of infecting healthy animals.....each serial lot subjected to rigid quality control tests for safety, potency and purity

Injected subcutaneously in 5 cc. doses—with booster dose of 5 cc. recommended at 6-month intervals.

Available in 25 cc. (5 dose), 50 cc. (10 dose), and 100 cc. (20 dose) vials.

Sold only to licensed veterinarians.



VETERINARY LABORATORIES • KANKAKEE, ILLINOIS

News from Merck...

SULFABROM SOLUTION 6.25%... joins SULFABROM BOLUSES to supply your total sulfa needs on an exclusive basis



NEW SULFABROM SOLUTION 6.25% AND SULFABROM BOLUSES ARE THE ONLY SULFAS AVAILABLE EXCLUSIVELY TO VETERINARIANS

PROLONGED ACTION: Ordinary sulfonamides, including sulfathiazole and sulfamethazine, peak during the first 24 hours after treatment, but then soon fall below the necessary or effective 5 mg./100 cc. level. Not so with SULFABROM SOLUTION or SULFABROM BOLUSES. They can establish and maintain therapeutic blood and plasma levels for as long as 48 hours in cattle.

DOSAGE AND ECONOMY: Recommended treatment levels with new SULFABROM SOLUTION are 25-50 cc. per 100 lb. of body weight when injected intravenously and 50 cc. per 100 lb. of body weight when injected intraperitoneally. Cost of treatment per animal is remarkably low—only about 50¢ to \$1.

RESULTS: The following remarks are abstracted from actual clinical investigation reports on the use of SULFABROM SOLUTION on file at the Merck Animal Science Research Department. (1) "Symptoms: Recently shipped-in cow. Temperature 106°. Labored breathing. Rales audible over chest area. *Diagnosis:* Pneumonia (shipping fever complex). *Treatment:* 700 cc. SULFABROM SOLUTION in one dose daily for two days. Sixty grams of SULFABROM BOLUSES given at time of I. V. injection. *Results:* Temperature returned to normal in 24 hours". (2) "Symptoms: Dystocia with removal by forced extraction of putrefied

fetus. Temperature 104°. Rapid pulse and breathing. Anorexia. *Diagnosis:* Metritis. *Treatment:* Two doses SULFABROM SOLUTION 700 cc. each. *Results:* Temperature 101.6° in 24 hours. Appetite returning". (3) "Symptoms: Foul hoof—limited to 'between the toes' variety with swelling. *Diagnosis:* Foot rot. *Treatment:* 700 cc. SULFABROM SOLUTION. *Results:* Eight of 11 animals walked normally in 48 hours with swelling reduced to normal or near normal. Three animals required second treatment and returned to normal in 48 hours".

These quoted reports are typical of those being received from clinical investigators and veterinarians. We believe they demonstrate that the only sulfas available to you exclusively—new SULFABROM SOLUTION and SULFABROM BOLUSES—are also the most effective you can use.

Merck Chemical Division, Merck & Co., Inc., Rahway, N. J.

SOLUTION 6.25% 
SULFABROM
(Sodium Sulfabromomethazine) BOLUSES 
VETERINARY

History of the AVMA

At the annual meeting in Atlantic City, President Tait Butler noticed that, despite urgings that graduates enter research and sanitary veterinary medicine: "... it still remains a fact that nine out of every ten graduates must earn their living as general veterinary practitioners, and therefore fitness for general practice is the standard by which the efficiency of college education should be judged." Urging greater attention to "the practical business side of veterinary education," Butler was critical of teachers "who never had any experience in general, unaided, independent veterinary practice of any sort."

M. E. Knowles noted "with extreme regret . . . the closing of the Harvard Veterinary Department . . . when so many illegitimate institutions remain open and prosper."

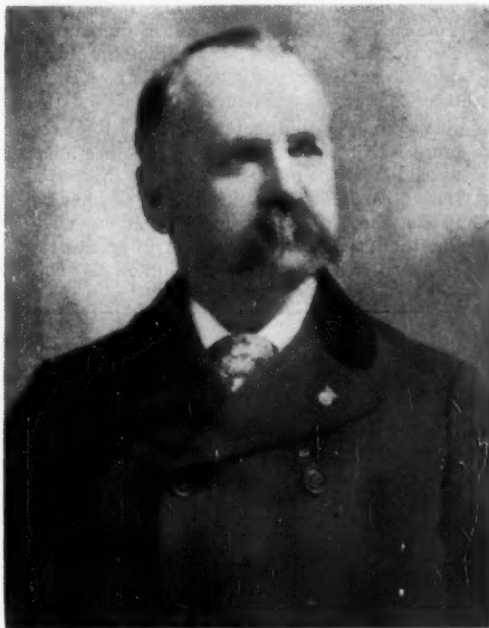
Concerning the work of the Association, he avers: "This is the age of specialization . . . it appears to me that three sections working concurrently, one considering questions of interest to the general practitioner and including the clinics; one dealing with sanitary questions, including meat and milk inspection, and general State medicine; and one comprising investigators, experiment station workers, etc." are needed.

In a report by "the rising young surgeon out of the West," L. A. Merrillat observed: "The gain in surgery and the lost confidence in internal medicine, so apparent in human medicine, is not yet apparent in veterinary practice, as inquiry among the veterinarians of this country brings out the confession that many practitioners never operate at all . . . and why? First, because of the difficulty of accurately diagnosing surgical diseases; and secondly, because of the lack of ingenuity displayed in securing the diseased patient . . . The veterinarian who is a good diagnostician, and who is a mechanic in the art of securing his patients specially for such operation, is a successful surgeon regardless of his deficiencies in other directions."

Clinical demonstrations included neurotomy and cunean tenotomy for spavin, myoneurotomy for crib-biting, and caudal myotomy for tail-straightening in horses.

The deaths of past-presidents Clement and Stickney and former secretary and treasurer Charles Burden were noted. A member, C. D. Morris, was expelled for having written a letter to the Secretary of War which had been in-

strumental in securing the defeat of an Army Veterinary Bill after it had passed both houses of Congress. Morris' expulsion was later rescinded. J. F. Winchester was elected president; SESCO Stewart, secretary; and W. H. Lowe, treasurer.



Dr. J. F. Winchester

JOHN F. WINCHESTER, D.V.S., was born in Lynn, Mass., Aug. 5, 1855, and was graduated from the Massachusetts Agricultural College in 1875 and from the American Veterinary College in 1878. Although primarily a general practitioner, he lectured on veterinary science at the colleges of Massachusetts and New Hampshire, and was a member of the Massachusetts Cattle Commission and the American Public Health Association. Renowned for his knowledge of tuberculosis, on one occasion when a physician did not appear for a scheduled talk at a medical society, Dr. Winchester filled in for him with an extemporaneous address, as polished as a laboriously-prepared speech.

Dr. Winchester was president of the Massachusetts V. M. A. for two years, and the AVMA from 1901-1902. He died on April 27, 1920.

New Study Sets on Veterinary Pathology Available

The Registry of Veterinary Pathology is a central agency sponsored by the American Veterinary Medical Association for the accumulation of material in the specific field of veterinary pathology for comprehensive investigation by specialists, for follow-up, and for teaching purposes. The Registry of Veterinary Pathology is a unit of the American Registry of Pathology, one of the major departments within the Armed Forces Institute of Pathology, Washington, D.C.

As one of the functions of the Registry, materials in the form of study sets are made available for temporary loan to interested individuals and institutions of the medical professions. Sets may be obtained by writing to the Director, AFIP, Attn. American Registry of Pathology, Washington 24, D.C.

Dr. A. O. Broome Joins Hill Packing Staff

Dr. Alfred O. Broome (MSU '43) has joined the Professional Products Division of



Dr. A. O. Broome

Hill Packing Company and will represent the Prescription Diet line of products in Michigan, Ohio, and Indiana. Dr. Broome has been in small animal practice in Battle Creek, Mich., for 14 years.

Study set(s) will be forwarded to civilian personnel *via* Railway Express, collect, and must be returned prepaid by the same carrier. In the case of active duty service personnel, set(s) are shipped at no cost to the requestor anywhere in the world. Sets are made available for loan periods of 2 weeks excluding transit time. This period can usually be extended upon request unless there is a waiting list.

The study sets are of 2 kinds: histology sets and pathology sets. The histology sets are composed of slides of representative tissues from specific animal species. The slides are listed, but there is no commentary.

The pathology sets are composed of either microslides, 2 by 2 transparencies, or both. These sets show lesions of specific disease entities or represent a collection of pathologic material falling within a group and are accompanied by commentaries describing the slides or transparencies to assist in their study.

Twenty-three of these sets are new ones complete during the last year.

The histology sets* that are now available include: Rhesus monkey, MS**; chimpanzee, MS; mink, MS; mouse, MS; rat, MS; rabbit, MS; bat, MS; goat, MS; cat, MS; pig, MS; dog, MS; and cow, MS.

The pathology sets now available include: Female Genital Tract (ACVP), 1953, MS; Granulomatous Disease (ACVP), 1954, MS; Poisons (ACVP), 1955, MS; Endocrine System (ACVP), 1956, MS; Diseases of Skeletal System* (ACVP), 1958, MS, TR†; Cardiovascular Diseases* (ACVP), 1959, MS, TR; Canine Eye, MS; Rinderpest, MS, TR; Hog Cholera, MS, TR; African Swine Fever, MS, TR; Echinococcus in Man and Animals, TR; B-Virus Infections of Monkeys,* MS, TR; Leptospirosis in Man and Animals,* TR; Analogous Patterns of Diseases in Man and Animals,* TR; Pulmonary Lesions in Canine Dirofilaria,* MS, TR; Infectious Myxomatosis of Rabbits,* TR; Spontaneous Lesions of Laboratory Animals,* MS; Coccidioidomycosis in Animals,* MS, TR; Feline Viral Rhinotracheitis,* MS, TR; and Viral Inclusions,* TR.

*The above sets are new ones completed in 1960; **MS. = Microslides; †TR = Transparencies. — AFIP Release, Nov. 15, 1960.

Norwich Appoints New Research Veterinarian

Dr. Myron Andrews (CAL '58) has been appointed director of the large animal clinical research section of The Norwich Pharmacal Company.

In his new position, Dr. Andrews will be responsible for clinical research and evaluation of new drugs, particularly the nitrofurans, developed by the company for the

treatment of large animal diseases. These drugs are distributed to the veterinary profession through the Eaton Laboratories Division.

Before joining Norwich, Dr. Andrews was on the staff of the department of veterinary

Professional Starting Salaries in Feed Industry Are Low

Results of a study by the American Feed Manufacturers Association indicate that the minimum starting salary for veterinarians in the feed industry is \$4,850 per annum. However, it was indicated that many veterinarians start at salaries considerably higher than this figure.

The average minimum starting salary of college graduates in all fields taking positions with feed companies was listed at \$4,787.

The study indicated further that only veterinarians and economists were required in all instances to have agricultural college training, although it was preferred in most other categories, too.—*Opportunities for College Graduates in the Feed Industry.*



Dr. Myron F. Andrews

science, North Dakota Agricultural College, where he conducted research and diagnostic work in veterinary toxicology, parastiology and clinical pathology.

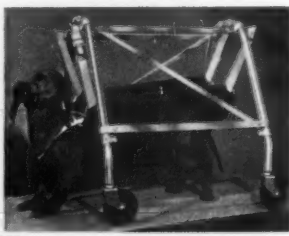
Recovery of Horses from Sesamoid and Carpal Fractures

"Today, fewer than 10 per cent of the horses [with] sesamoid and third carpal bone fractures are destroyed. Our department of surgery (University of Pennsylvania) estimates that 60 per cent of race horses with sesamoid fractures are now returning to compete in the same quality races in which they participated before being injured. The corresponding figure for horses suffering from third carpal bone fractures is 50 per cent."—*Dr. Mark Allam. Advancing Vet. Med. (Sept., 1960): 1.*

Quiz for Quidnuncs

1. In cattle with glossitis, what losses can be expected? Page 8.
2. In cattle with mycotic dermatitis caused by *Scopulariopsis brevicaulis*, what is the expected course of disease? Page 9.
3. Of what significance is African horse-sickness to veterinary practitioners in the United States? Page 15.
4. In dogs, what surgical technique has proved successful in correction of perianal fistulous tracts? Page 22.
5. What orthopedic technique proved successful in fixation of a distal epiphyseal fracture in a Shetland pony? Page 13.
6. Why was colostomy performed in a pig? Page 20.

HOW TO HANDLE THE PARALYTIC PET DURING CONVALESCENCE



Reg. U.S. Patent Office

ADVANTAGES

- 1) Only such apparatus available for proper re-education of muscles for more and faster recoveries.
- 2) Saves time and labor necessary to rehabilitate paraplegics by massage, forced exercise, and constant supervision of the attendant.
- 3) Eliminates pressure sores, unsightly denuded areas, and self-mutilation due to lack of movement.
- 4) Insures client respect, good will, and superior public relations.
- 5) May be rented out to clients who wish their pet to spend his convalescence at home.

Sold to Veterinarians only

Adjustable Dog Walker \$50 (Freight added).
Satisfaction or money back in thirty days.

Send check or money order to

Hugus and Knuth, 1680 Mission St.

San Francisco 3, California

Public Relations Aid for Veterinary Practitioners

A new service for veterinarians, designed to help them in their public relations with pet owners, was announced recently by the Gaines Professional Services Department, Battle Creek, Mich.

The service consists of furnishing copies of the publication, "Your Family Pet," to the small animal practitioner for distribution to his clients. Veterinarians or veterinary hospitals who are members of the Gaines Professional Feeder Plan will receive a quantity of "Your Family Pet" without charge. Non-members and veterinary societies will be able to obtain copies at cost.

"Your Family Pet" is a 32-page illustrated magazine containing interesting and helpful information concerning health and welfare of the various pets. It helps the pet owner become better acquainted with the services of the veterinary practitioner and profession. Entirely ethical in its approach, the publication has received general approval of many leaders in the profession.

APPLICATIONS

Applicants Not Members of Constituent Associations

In accordance with paragraph (c) of Section 1, Article I, of the Bylaws, the names of applicants who are not members of constituent associations shall be published in the JOURNAL. Written comments received by the Executive Secretary from any active member regarding the application as published, will be furnished to the Judicial Council for its consideration prior to acceptance of the application.

ANDERSON, DONALD L.

P. O. Box 1067

Oak Ridge, Tenn.

D.V.M., Texas A. & M., 1953

Vouchers: D. G. Brown and L. P. Jones

W. P. Johnson Heads Feed Accounts for Cyanamid

Dr. W. P. Johnson (KSU '42) has been appointed manager for national feed accounts for American Cyanamid Company's Agricultural Division.



W. P. Johnson

During the seven years he has been with Cyanamid, Dr. Johnson has held several positions both within the Lederle Division and the Agricultural Division. Prior to his new appointment, he was manager of animal industry field development.

Dr. Johnson spent three years as an officer in the Army Veterinary Corps. Following the war he was in private veterinary practice in Slater, Mo. for eight years.

GOOD
RECORDS
are the KEY

to successful
Practice Management

Colwell's
DAILY LOG



- **THE DAILY LOG** — will provide clear, easy reference to all the business facts you need in 1961 — overhead; receipts; charges; taxes; net earnings. Used and preferred by thousands of doctors since 1927 — recommended by tax experts and accountants as a short-cut to office efficiency.
- **SAVES TIME** — only a few minutes a day required to keep complete practice management records — nothing is left to chance or memory — your tax returns can be verified quickly and easily.
- **EASY TO USE** — no bookkeeping knowledge required — no mix-ups at billing time — no forgotten charges. Gives you a day-by-day and month-by-month record of all your business activities — plus a complete year-end summary.
- **FULLY DATED** — for easy reference. Month, date and day printed on each Daily Page. Holidays plainly marked. Looseleaf forms post-bound in attractive, dated cover.
- **PRICES** — Regular Edition, one 40 line page a day, one volume, dated for 1961 — \$7.75. Double Log Edition, two facing pages of 40 lines for each day, two volumes, dated for 1961 — per set — \$13.50.

SATISFACTION GUARANTEED

THE COLWELL COMPANY
381 Kenyon Road
Champaign, Illinois

Please send me 1961 ☐ Regular ☐ Double Daily Log for Physicians. Remittance enclosed.
☐ Please send me more information plus FREE Record Supplies Catalog Kit.

Dr. _____

Address _____

City _____ State _____

M·A·C



**Quick relief for Bone,
Bursal or Tendon Lameness**
Single Bottle.....\$2.00
3 and 1 free.....5.00
6 and 2 free.....9.00
12 and 4 free.....17.00
24 and 4 free.....28.00

**CARTER-LUFF CHEMICAL CO.
Hudson, N. Y.**

Vaccination Standardization Needed

The lack of an official minimal standard for all biological products produced commercially, and the lack of uniformity in immunizing procedures, were cited as the most important problems associated with control of canine distemper during the last convention of the New York State V.M.S.

To correct these deficiencies, it was suggested that official minimal standards on products offered for sale be determined, and that all veterinarians agree to employ the same type of product and technique for immunizing.—*New York City Vet.*, 3, (1960): 5.



Hundreds of guests toured the new Medical Research Laboratories of Chas. Pfizer & Co., Inc., Groton, Conn., at its formal opening on October 6. Here four University of Connecticut scientists, all members of the Animal Diseases Department, join J. Jerome Thompson, Pfizer vice-president (extreme right), and Warren M. Reynolds, manager, Pfizer's Agricultural Research and Development Center, Terre Haute, Ind. (center), as one of the medical center's scientists explains the fermentation cultures that are "brewing" in the jars on the rack. Guests, from left to right, are: Svend Neilsen, D.V.M.; Monte N. Frazier, D.V.M.; Charles F. Heimboldt, D.V.M., head of Animal Diseases department; and Dr. Roy E. Luginbuhl.

Record 109 Pups Whelped by English Setter

A new record for motherhood has been set in the dog world. Vicky, an English Setter, has had 109 pups—and she's just over 7 years old!

She's had 11 litters—from quadruplets to quadrodécuplets twice. (That's from 4 to 14.) Her litters have been in this order: 4, 13, 8, 14, 11, 14, 10, 11, 11, 6, and 4.

The prolific young lady's name in the American Field Stud Book, #529453, is Purina's New Victory, and she was born on Aug. 5, 1953. Her sire is Dashing Horseford Frank, and her dam is Purina Lucky Lady.

Her record isn't intentional—she is by no means a prize dog reared from puppyhood to be a star brood bitch. She is one of several bitches selected for breeding and help in the

nutrition studies. She has been given only the usual careful attention accorded all 500 of the dogs at the Purina Dog Care Center near St. Louis, Mo.



Purina's New Victory and Florendale's Lou's Poncho, parents of 109 English Setter pups.

Dr. E. R. Marookian Promoted by Merck

Dr. Edgar R. Marookian (UP '54) has been appointed manager of Technical Service, Animal Health Products, at the Merck Chemical Division of Merck & Co., Rahway, N.J.



Dr. Edgar R. Marookian

For the past two years, Dr. Marookian has been technical specialist of the South Central Region with headquarters in Dallas. He was in veterinary practice for four years in Clinton, N.J., before joining Merck & Co., Inc., in 1958.

Another feature of this record is that all of the 109 pups were sired by the same stud.

He is Florendale's Lou's Poncho, AFST, #493243. He was born on April 15, 1950. Poncho has been the principle stud used at the Purina Dog Care Center and has sired 56 litters totaling 510 pups.

Previous records for motherhood were held by 2 other English Setters, Sally and Sally II. Both were Purina dogs. Sally whelped 99 puppies in 13 litters from May, 1929, through July, 1936. Sally II had 101 puppies in 12 litters from May, 1937, through September, 1943.—*News release, Purina Dog Care Center, St. Louis, Mo., Nov. 11, 1960.*



PREGNANCY DETERMINATION

In mares 45th to 150th day \$7.50 Use dry sterile equipment to collect 20-cc blood sample and forward to:

COLORADO SERUM COMPANY
4950 York St. Denver 6, Colo. MAIn 3-5373

Results reported to profession only within 96 hours. Other professional diagnostic laboratory services available. Write for free information.

For treating respiratory diseases

No other injectable offers all these advantages

**Broad spectrum—effective against a wide range
of organisms involved in respiratory diseases
and associated secondary bacterial infections**

**Convenient—a concentrated, ready-to-use
solution that can be administered
intravenously, intramuscularly or
subcutaneously**

Rapidly absorbed from injection site

**Highly stable—can be carried in bag or car
without danger of freezing . . . requires
no refrigeration**

Liquamycin Injectable is a recommended addition to your drug inventory during the fall and winter months when the greatest incidence of respiratory diseases occur.

Wide range of antimicrobial activity is an advantage when treating the mixed bacterial infections* commonly encountered in respiratory cases under field conditions.

This preconstituted, ready-to-use solution form is rapidly absorbed from the injection site. Following the administration of 2 mg. per pound of body weight in cattle, the antibiotic blood serum level can be detected for at least 36 hours.



Economical. Costs no more to use than many products that are not as effective or convenient to use.

And this new, all-liquid form offers many conveniences of use.

• versatile—Liquamycin could be the only antibiotic in your bag. Yet

you could enjoy the convenience of selecting the injection route that best serves your treatment purposes—intravenous, intramuscular or subcutaneous.

• no special handling problems—Liquamycin Injectable needs no refrigeration . . . no protection from freezing even at extremely low

temperatures. And its highly stable form assures a long storage life.

• ready to use—no mixing needed.



Liquamycin Injectable is available in 500-cc. bottles containing 25 grams of oxytetracycline activity and in 50-cc. dispensing vials containing 2.5 grams oxytetracycline activity.



*due to oxytetracycline-susceptible organisms

Sold only to veterinarians

LIQUAMYCIN[®] INJECTABLE

BRAND OF OXYTETRACYCLINE HCl



Department of
Veterinary Medicine
Chas. Pfizer & Co., Inc., New York, N. Y.
Science for the world's well-being

Coming Meetings

Notices of coming meetings must be received 30 days before date of publication.

New York State Veterinary College. Fifty-third annual conference for veterinarians. Cornell University, Ithaca, N.Y., Jan. 4-6, 1961. Dr. George C. Poppensiek, New York State Veterinary College, Cornell University, Ithaca, N.Y., dean.

American Veterinary Radiology Society. Mid-year meeting. Hotel Severin, Indianapolis, Ind., Jan. 10, 1961. Dr. J. J. Fishler, 3421 S. Main St., Elkhart, Ind., secretary.

Intermountain Veterinary Medical Association. Thirty-third annual meeting. Newhouse Hotel, Salt Lake City, Utah, Jan. 11-14 1961. Mr. Peter B. Woolley, 306 Ness Building, 28 West Second South, Salt Lake City, Utah, manager.

Indiana Veterinary Medical Association. 77th annual convention. Hotel Severin, Indianapolis, Ind., Jan. 11-13, 1961. Dr. L. M. Borst, 3315 Shelby St., Indianapolis, Ind., secretary.

Kansas Veterinary Medical Association. Fifty-seventh annual convention. Broadview Hotel, Wichita, Jan. 15-17, 1961. Dr. M. W. Osburn, Kansas State University, Division of Extension, Manhattan, Kan., secretary-treasurer.

Wisconsin Veterinary Medical Association. Forty-fifth annual meeting. Schroeder Hotel, Milwaukee, Wis., Jan. 15-17, 1961. W. J. O'Rourke, 540 W. Washington Ave., Madison 3, Wis., secretary.

Iowa Veterinary Medical Association. Annual meeting. Hotel Fort Des Moines, Des Moines, Iowa, Jan. 17-19, 1961. Dr. J. A. Henderson, P.O. Box 127, Ankeny, Iowa, president-elect.

Pennsylvania, University of. Sixty-first annual conference of veterinarians. University of Pennsylvania School of Veterinary Medicine, Jan. 17-18, 1961. Dr. Donald Patterson, School of Veterinary Medicine, University of Pennsylvania, program chairman.

Michigan State University. Thirty-eighth postgraduate conference for veterinarians. College of Veterinary Medicine, Michigan State University, East Lansing, Mich., Jan. 18-20, 1961. Dr. W. W. Armistead, dean.

Nevada State Veterinary Association. Annual meeting. Stardust Hotel, Las Vegas, Nev., Jan. 22-24, 1961. Dr. Murray H. Phillipson, 1720 S. Main St., Las Vegas, Nev., secretary.

Save 10 Hours Reading Every Month

★ MORE TIME WITH YOUR FAMILY . . .

★ MORE TIME FOR YOURSELF . . .

. . . with this revolutionary new indexing service that "reads" all your essential veterinary journals for you . . . puts all their vital information permanently at your finger tips in a simple, easy-to-use card file.

Edited by practicing doctors of veterinary medicine . . . cataloged by professional librarians . . . this service provides a simple low-cost way to store vital information and yet keep it ready for instant use.

Try This Service FREE for One Month

We'll gladly enter a 30-day trial subscription for you . . . so you can have full information on this service and try it without cost or obligation in your office.

PROFESSIONAL MEN'S
INDEXING SERVICE
Veterinary Division

222 S. Eighth Street, St. Louis 2, Missouri

(Mail this coupon today)

Professional Men's Indexing Service Veterinary Division

222 South Eighth St., St. Louis 2, Mo.

I would like full information on your new service.
Please enter my name for the free 30-day trial subscription you offer.

NAME

ADDRESS

Oklahoma Veterinary Medical Association. Annual meeting. Oklahoma State University, Student Union Bldg., Stillwater, Okla., Jan. 22-24, 1961. Dr. W. D. Speer, 538 S. Madison, Tulsa, Okla., secretary.

Tennessee Veterinary Medical Association. Annual meeting. Noel Hotel, Nashville, Tenn., Jan. 22-24, 1961. Dr. H. W. Hayes, 5009 Clinton Pike, Knoxville, Tenn., secretary.

Arkansas Veterinary Medical Association. Annual meeting. Hotel Marion, Little Rock, Jan. 22-24, 1961. Thayer D. Hendrickson, 7824 Cantrell Rd., Little Rock, Ark., secretary-treasurer.

Minnesota Veterinary Medical Association. Annual meeting. Leamington Hotel, Minneapolis, Minn., Jan. 23-25, 1961. B. S. Pomeroy, 1443 Raymond Ave., St. Paul 8, Minn., secretary.

Louisiana State University. Short Course for veterinarians. Pleasant Hall, Louisiana State University campus, Baton Rouge, Jan. 24-25, 1961. Dr. R. B. Lank, Department of Veterinary Science, Louisiana State University, chairman.

North Carolina Veterinary Medical Association. Twenty-third annual meeting. North Carolina State College, Raleigh, N.C., Jan. 25-26, 1961. Dr. Edward G. Barre, Veterinary Section, North Carolina State College, School of Agriculture, Raleigh, N.C., head.

Ontario Veterinary Association. Annual meeting. Royal York Hotel, Toronto, Ont., Jan. 26-28, 1961. Dr. W. E. Jolliffe, 97 Eglinton Ave., East, Suite 102, Toronto 12, Ont., registrar.

Ontario Veterinary Association. Eighty-seventh annual meeting. Royal York Hotel, Toronto, Ont., Jan. 26-28, 1961. Dr. R. J. Humble, Ontario Veterinary College, Guelph, Ont., chairman.

Texas Veterinary Medical Association. Annual convention. Rice Hotel, Houston, Jan. 29-31, 1961. Dr. King Gibson, 3906 Lemmon Ave., Dallas, Texas, co-chairman.

California Veterinary Medical Association. Midwinter conference. School of Veterinary Medicine, University of California, Davis, Jan. 30-31, Feb. 1, 1961. Mr. Kenneth Humphreys, 3004 Sixteenth St., San Francisco, Calif., executive secretary.

California Veterinary Medical Association. Annual midwinter conference. School of Veterinary Medicine, University of California, Davis, Calif., Jan. 30-Feb. 1, 1961. Mr. Kenneth Humphreys, 3004 16th St., San Francisco, Calif., executive secretary.

Western Poultry Disease Conference. University of California, Davis, Calif., Feb. 1, 1961. Dr. A. S. Rosenwald, Extension Poultry Pathologist University of California, chairman.

Ohio State Veterinary Medical Association. Annual meeting. Commodore Perry Hotel, Toledo, Ohio, Feb. 5-8, 1961. Dr. R. E. Rebrassier, 1411 West Third Ave., Columbus 12, Ohio, executive secretary.

West Virginia Veterinary Medical Association. Annual meeting. Greenbrier Hotel, White Sulphur Springs, W. Va., Feb. 12-13, 1961. Dr. Harry J. Fallon, Beckley, W. Va., secretary.

Sierra Veterinary Medical Association. Second annual meeting. Mammoth Mountain Inn, Mammoth Lakes, Calif., Feb. 12-17, 1961. Dr. John R. Puckett, 13476 Washington Blvd., Venice, Calif., president.

(Continued on adv. p. 48)



**NOW
EFFECTIVE
TREATMENT
OF RINGWORM**

**With
Vanguard® 45**

Vanguard® 45 is a powerful, but safe fungicide, formulated specifically to attack the micro-organisms that cause ringworm. Furnished in wettable powder form, it readily forms a water suspension, and is easily and quickly applied. The active ingredient in Vanguard® 45 is N-trichloromethylmercapto-4-cyclohexene-1, 2-dicarboximide.

**EFFECTIVE ON CATTLE,
HORSES, SWINE, DOGS
AND CATS**

Available from your Professional
Veterinary Distributor

Mail coupon for Technical Literature
on Vanguard® 45



**R. T. VANDERBILT CO.,
SPECIALTIES DEPARTMENT
230 PARK AVE., NEW YORK 17, N.Y.**

Gentlemen, Please send Technical P-18
Data Sheets #49 and 69

Name

Street

City State

(Please attach to your Professional letterhead)

(Continued from adv. p. 47)

Missouri Veterinary Medical Association. Sixty-ninth annual meeting. Hotel Statler-Hilton, St. Louis, Feb. 19-21, 1961. Paul L. Spencer, D.V.M., P.O. Box 283, Jefferson City, Mo., secretary.

Colorado State University. Twenty-second annual conference veterinarians. Glover Veterinary Hospital, College of Veterinary Medicine, Colorado State University, Fort Collins, Colo., Feb. 20-22, 1961. Dr. O. R. Adams, Department of Veterinary Clinics and Surgery, Colorado State University, Fort Collins, Colo., program chairman.

Illinois State Veterinary Medical Association. Annual meeting. LaSalle Hotel, Chicago, Ill., Feb. 20-22, 1961. Dr. C. B. Hostetler, 1385 Whitcomb Avenue, Des Plaines, Illinois, executive secretary.

Manitoba Veterinary Medical Association. Winnipeg, Manitoba, Feb. 27-28, 1961. Dr. K. Warren, Killomey, Manitoba, secretary.

Alabama Veterinary Medical Association. Annual meeting. Whitley Hotel, Montgomery, Ala., March 19-21, 1961. Dr. M. K. Heath, School of Veterinary Medicine, Auburn, Ala., secretary.

Animal Disease Research Workers in the Southern States. Fifteenth annual meeting. A. & M. College of Texas, College Station, Texas, April 6-7, 1961. Dr. D. A. Porter, USDA Regional Laboratory, Auburn University, Auburn, Ala., secretary-treasurer.

American Veterinary Medical Association. Ninety-eighth annual meeting. Sheraton-Cadillac Hotel, Detroit, Mich., Aug. 21-24, 1961. Dr. H. E. Kingman, Jr., 600 S. Michigan Ave., Chicago 5, Ill., executive secretary.

Foreign Meetings

Fourth International Congress on Animal Reproduction. The Hague, Netherlands, June 5-9, 1961. For additional information contact: the Secretariat of the Fourth International Congress on Animal Reproduction, 14, Burge-meester de Monchyplein, The Hague, Netherlands, Dr. L. Hoedemaker, secretary to the organizing committee.

Eighth International Congress of Animal Husbandry. Hamburg, Germany, June 13, 1961.

Twelfth World's Poultry Congress. Show Grounds of the New South Wales Royal Agricultural Society, Sydney, Australia, Aug. 13-18, 1962. Dr. Cliff D. Carpenter, chairman, U. S. Participation Committee, 1207 Emerald Bay, Laguna Beach, Calif.; Dr. A. William Jasper, secretary, c/o AFBF, 2300 Merchandise Mart, Chicago 54, Ill.

NEW

EFFECTIVE THERAPY for DIARRHEA and DIARRHEAL ENTERITIS

Each SULFOCTAN tablet contains:

Phthalylsulfacetamide	0.4 Gm. (6 grs.)
Octin mucate (isometheptene mucate)	0.065 Gm. (1 gr.)
Tannalbin (tannin albuminate, dessic.)	0.65 Gm. (10 grs.)
plus natural meat substance	

dosage: Dogs — 1 tablet per 25 pounds of body weight, twice daily, usually for three to five days.

Cats and "toy" dogs — proportionally less, according to size.

N.B. Instruct client to keep SULFOCTAN out of the patient's reach. Dogs really go for SULFOCTAN'S natural meat taste and will eat as much as they can get their teeth into.

SULFOCTAN supplied in bottles of 50 and 250; available only through your veterinary distributor.

Tennalbin, Sulfoctan, Octin®



Veterinary Division

SULFOCTAN™

with

NATURAL MEAT SUBSTANCE

KNOLL PHARMACEUTICAL COMPANY

ORANGE

NEW JERSEY

Bind Your Copies

of the
**JOURNAL OF THE AMERICAN VETERINARY MEDICAL
ASSOCIATION**
and
**AMERICAN JOURNAL
OF
VETERINARY RESEARCH**

The publishers have effected an arrangement with one of America's foremost bookbinders by which subscribers can have their journals economically bound, to the publisher's specifications.

Your copies of the JOURNAL of the American Veterinary Medical Association will be bound in the finest grade black washable buckram, with your name imprinted on the front cover. Price \$4.45.

Ship journals parcel post. Bound volumes will be returned transportation prepaid. Full remittance must accompany order.

The Book Shop Bindery

Publisher's Authorized Binding Service

**Creators of Distinctive Bindings
Since 1895**

430 W. Erie St., Chicago 10, Ill.



Absorption of Heterologous Antibodies by Newborn Pigs

In the first ten hours after birth, each of 16 pigs from three litters was given 75 ml. of immune horse serum, containing agglutinins against *Salmonella choleraesuis*, via stomach tube. Blood samples were taken six hours after the last feeding.

By electrophoresis, agglutinins were found to be absent in umbilical cord serum at the time of birth but present after administration of the horse serum. The relative absorption of agglutinin ranged from 4.6 to 24.8 per cent. Apparently, immune globulins are absorbed by pigs, through the intestine, as readily from horse serum as from pig serum.—B. Olsson in *Nord. Vet.-med.* (July-August, 1959): 441.

More Cattle Needed to Fill Demand for Lighter Slaughter Weights

Increase in cattle numbers is less alarming now than in any other period of beef industry history. Changes in markets and the de-

mand for cattle slaughtered at the lighter, handy carcass weights mean that there will be a faster turnover in feedlots. This means that cattle will be finished for slaughter between 600 and 1,000 lb. To meet this faster slaughter and more rapid turnover in the feedlots, more replacement cattle will be required. More cattle numbers will be required to supply the dressed meat poundage at today's consumption levels. More cattle will be needed to supply the same total pounds of beef because of demands for lighter slaughter weights. Marketing animals for slaughter before they are a year old will become the predominant practice.—*Feeds Illus.*, 2, (May, 1960): 17.

TAMM UDDER SUPPORTS

UNHOOK HERE FOR MILKING

FOR MORE PROFITABLE PRODUCTION

- ★ Eliminates congestion and caking.
- ★ No smashed teats, no self-sucking.
- ★ Ideal for hot baths or ice packs.
- ★ Soft, pliable udders at freshening, with top production from start.

SMALL for 900 to 1150 lb. cows,
MEDIUM for 1150 to 1600 lbs.,
LARGE for over 1600 lbs.
State size wanted at \$18.50.

Dealers and veterinarians write for prices

See your dealer or write

FRANKSVILLE SPECIALTY CO.
FRANKSVILLE WISCONSIN

Dr. Harold L. Hurst Now Research Director at Globe Laboratories

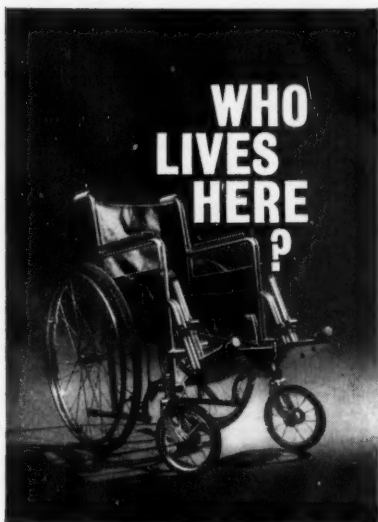
Dr. Harold L. Hurst (TEX '48) has been named director of research at Globe Laboratories and will supervise the development of veterinary biological products and pharmaceuticals at the firm's plant in Fort Worth, Texas.

Dr. Hurst was formerly a pathologist with Hazelton Research Laboratories, Falls Church, Va. Here he studied the toxic effect of chemicals, cosmetics, food additives, agricultural chemicals, and other compounds to aid firms in preparing data to present to the FDA for product approval and licensing.

"Skijoring" Gains Popularity

You no longer need hills to make use of your skis, as many "skijoring" enthusiasts have found. All you need is a good sense of timing and balance and the ability to handle sled dogs.

"Skijoring," the exciting new winter sport that is gaining popularity in the northern states, permits amateurs and children to ski behind the dogs with little chance of injury. Except for the initial lurch when the dog team starts, it's smooth skiing, even on open terrain—Gaines Dog Research Center, Feb., 1960.



A child...one of tens
of thousands who need
your help. Please give
generously to the

MARCH FOR MUSCULAR DYSTROPHY

MUSCULAR DYSTROPHY ASSOCIATIONS
OF AMERICA, INC.
1790 Broadway, New York 19, New York



New "Feedbag" Gives Oxygen to Horses

Oxygen therapy for horses has been made as simple as putting on the feedbag.

Horses are treated with oxygen by fitting over their noses a new type of plastic mask.

The light weight mask is held in place by a built-in elastic band around the animal's nose. Oxygen is fed in through corrugated tubing to the bottom of the unit. The mask itself is large enough to serve as a reservoir, holding enough oxygen to accommodate a horse's sudden deep breaths.—Nat. Cylinder Gas Div., Chemetron Corp. Release, New York, Oct. 27, 1960.

BROKEN TEETH

—repaired in bottom clipper blades.
Top and bottom blades sharpened to
match. Save money—Guaranteed.
Prices on Request

HIGHLY SPECIALIZED SHARPENING
Sales—Repairing on Oster
and Stewart clippers.

Sharpened Blades Tested on Rabbit Fur
OSTER A-2 STEWART
Prompt Service—Est. 25 years

MAIL TO

CLIPPER SERVICE OAK RIDGE
NEW JERSEY

CLASSIFIED ADVERTISEMENTS

PERSONAL WANT ADS—\$4.00 for the first 25 words and 10 cents for each additional word; 35 cents for use of box number.

TOTAL WORD COUNT must include complete box number address (7 words) or personal address line.

COMMERCIAL WANT ADS—\$5.00 for the first 25 words, 25 cents for each additional word; \$1.00 for use of box number. (See paragraph above for total word count.)

Remittance must accompany ad.

DEADLINES

1st of month issue — 8th of month preceding date of issue.

15th of month issue — 22nd of month preceding date of issue.

Names of classified advertisers using key letters can not be supplied. Address your reply to the box number, c/o JOURNAL of the AVMA, 600 S. Michigan Ave., Chicago 5, Ill., and it will be sent to the advertiser.

Wanted—Veterinarians

Wanted—associate for AAHA small animal hospital. California license required. Salary open. Address Dr. Norman Sax, 3737 Tweedy Blvd., South Gate, Calif. LOrain 9-1122.

Wanted—experienced relief veterinarian for small animals, approximately 6 weeks in March, April or May. Westchester County. New York license. Address Box A 9, JOURNAL of the AVMA.

Wanted—assistant veterinarian for well-established suburban small animal practice. Apartment available. Desirable Ohio location. Address Box L 18, JOURNAL of the AVMA.

Wanted—experienced veterinarian for 8 weeks, approximately January 15 to March 15. Living quarters available. Chicago area. Write salary expected, experience. Address Box A 20, JOURNAL of the AVMA.

Wanted—veterinarian for large animal practice in Oklahoma. Give details including experience and salary requirements. Address Box L 53, JOURNAL of the AVMA.

Poultry Pathologist

An unusual opportunity for ambitious man to join rapidly growing company now a leader in its field.

Degree in veterinary medicine, experience in poultry pathology or graduate training in pathology or microbiology necessary. Will immediately assume responsibility for a diagnostic laboratory, act as a company consultant to poultry growers and work with sales force. Salary commensurate with experience and background. Write stating background, present position and salary, qualifications. Address Box A 24, JOURNAL of the AVMA.

Position available for graduate veterinarian. General practice in New York State. Open May 1. Address Box A 22, JOURNAL of the AVMA.

Wanted—licensed veterinarian for staff of completely-equipped, modern, AAHA small animal hospital in New York City suburb. Complete details in first letter. Address Box A 21, JOURNAL of the AVMA.

Wanted—assistant veterinarian for practice in Pittsburgh, Pa. Eventual partnership or take-over. Address Box A 17, JOURNAL of the AVMA.

Wanted—recent or June graduate as associate for well-established small animal practice in Chicago. No living quarters available. Address Box A 6, JOURNAL of the AVMA.

Veterinarian wanted for the Ute Mountain Ute Tribe, Towaoc, Colo. Applications on form 57 will be received from graduate D.V.M.'s until position is filled. For further information, contact John L. Kelley, Cortez, Colo. (phone LO 5-7317) days only, or Chas. D. Whitehorn, Cortez, Colo. (LO 5-7317 days and LO 5-3240 nights). Mailing address is Towaoc, Colo.

Wanted—associate veterinarian for small animal hospital on Long Island. Good opportunity with future. Starting salary range—\$9,000 to \$10,500. Annual increments. New York license required. Address Dr. S. B. Seader, 74 N. Long Beach Rd., Rockville Centre, N.Y.

Wanted—assistant veterinarian for small animal practice in Arizona. Good salary, possibly leading to partnership. Address Box A 5, JOURNAL of the AVMA.

Wanted—veterinarian for assistant or associate position in AAHA hospital. Salary and opportunity supplied on request. Write Cole Clinic for Small Animals, 2288 Sheridan Dr., Buffalo 23, N.Y.

Wanted—Positions

Licensed veterinarian desires position in Florida. Experience in large and small animal practices. References available. Address Box A 15, JOURNAL of the AVMA.

OSU graduate with 4 years' experience, desires position with small animal hospital in Ohio or Pennsylvania. Address Box A 14, JOURNAL of the AVMA.

Veterinarian, graduate from Poland in 1946, seeks assistant position in mixed practice. Single. Permanent resident of the U.S.A. Please give complete information in first letter. Address Dr. Z. Zakowski, G. P. O. Box 957, New York 1, N.Y.

Graduate (WSU '60), married, desires position in practice with at least 80 per cent small animals. Licensed in Washington, Oregon and California. Address Box A 3, JOURNAL of the AVMA.

Experienced graduate (CAL '58), completing military obligation Jan. 9, 1961, desires small animal position in California leading to permanent association or purchase. Address Dr. L. C. Kidwell, 335 Baden Ave., S. San Francisco, Calif.

Graduate (KSU '59), married, with 1½ years experience with small animals, desires position in a small animal hospital or mixed practice in the Midwest leading to partnership, lease or purchase. Available immediately. References upon request. Will answer all inquiries. Address Box A 8, JOURNAL of the AVMA.

Recent graduate, married, considerable small animal experience, Illinois licensed, desires position in busy practice. Prefer Chicago or other sizeable city. No military obligations. State terms. Address Box A 2, JOURNAL of the AVMA.

For Sale or Lease—Practices

For sale—large and small animal hospital, fully-equipped, suitable for 2 veterinarians. Thriving Midwest location. Substantial amount of money required. Best of reasons for selling. Address Box M 8, JOURNAL of the AVMA.

For sale—busy small animal practice in suburban Philadelphia, hospital, and separate 7-room residence. Established ten years. Prominent corner on main street. Unusual opportunity. Selling to divide equity. Address Box A 23, JOURNAL of the AVMA.

For sale—Missouri mixed practice. Modern small animal hospital, house, instruments, equipment, etc. Gross over \$30,000. Priced at real estate value. Low down payment. Address Box M 55, JOURNAL of the AVMA.

For sale—well-established practice in northwestern Iowa. Office, residence, equipment and drugs. Terms to suit. Address Box A 18, JOURNAL of the AVMA.

For sale—established Wisconsin practice and residence. 90 per cent small animals. Hospital, 19 cages, equipment, and inventory. Selling at less than yearly gross—\$20,000. Address Box A 16, JOURNAL of the AVMA.

For sale—small animal practice and hospital. Will support two veterinarians. Price—\$35,000. \$15,000 down payment. Gross over \$40,000. Established in 1923. New York State license required. Must retire. Write or apply in person. Address Dr. Alexander Slawson, 2414 Amsterdam Ave., New York 33, N.Y.

For sale or lease—small animal hospital and house 55 miles northwest of Chicago. Address Box A 13, JOURNAL of the AVMA.

VETERINARIAN

Position available in new toxicology laboratory for research-minded man to conduct toxicological studies. Prefer experience in clinical laboratory or pathological procedures.

- Good salary
- Liberal benefit plan
- Pleasant suburban environment

Send detailed resume
to Personnel Department

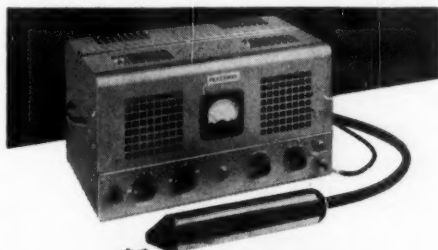
SCHERING CORP.

60 Orange St., Bloomfield, N.J.

For sale—small animal hospital, well-equipped, attractive, in Kansas City area. Address Box A 12, JOURNAL of the AVMA.

For sale—small animal practice, house and hospital with facilities for large animals. Gross—\$30,000. Central Texas. Best location in city of 100,000. Address Box A 1, JOURNAL of the AVMA.

For sale—small animal hospital and house in large Massachusetts city. Address Box A 10, JOURNAL of the AVMA.



PLECTRON EJACULATOR

Ideal for bulls; also smaller animals

- Simple to operate; highest quality construction
- Has high power and low power probe outlets
- Output frequency control
- Low (20-40 Cycles per second) frequency eliminates most spasmodic and undesirable reactions
- A major advancement in collecting semen for artificial insemination
- Collect and classify semen from each bull before purchase or sale
- Save expense of wintering sterile bulls

For full details and prices write:

PLECTRON CORPORATION
Overton, Nebraska

Wanted—Practices

Wanted—Small animal or mixed practice, preferably in Northeast, capable of supporting two veterinarians, and having expansion potential. Address Box A 19, JOURNAL of the AVMA.

Wanted—small animal hospital for lease with or without option to buy. State terms. All inquiries answered and confidential. Address Box A 11, JOURNAL of the AVMA.

Wanted to buy or lease—small animal or mixed practice in the Midwest. Have some capital available. Address Box A 8, JOURNAL of the AVMA.

Wanted—mixed practice in Kansas or Oklahoma. Can make sizeable down payment. Would consider lease and sale within one year. Address Box A 4, JOURNAL of the AVMA.

Wanted—to lease or purchase good small animal practice in New York, Ohio, Tennessee, Mississippi, or California. Address Box A 7, JOURNAL of the AVMA.

Miscellaneous

Wanted—dogs with glaucoma, especially female beagle, wirehair fox terrier, and cocker spaniel. We will send crate and pay postage. Address Dr. G. D. Whitney, Dentree Dr., Orange, Conn.

For sale—General Electric x-ray, complete with table, stereo, bucky, view boxes, cassettes, tanks. Reasonable. Address R. C. Peckham, M.D., Gaylord, Mich. Phone 4271.

Pregnancy diagnosis in mares—45th to 150th day. Request mailing tubes: \$7.00. Address Pregnancy Diagnostic Laboratories, Dysart, Iowa.

Wanted—pups with cleft palate or parent dogs of such pups, for study of cause and treatment of human cleft palate. Address Dr. R. Dean or Dr. John Kelleher, c/o Mercy Hospital, 2221 Madison Ave., Toledo 2, Ohio, or call collect CH 8-6428, Toledo, Ohio.

Index to Advertisers

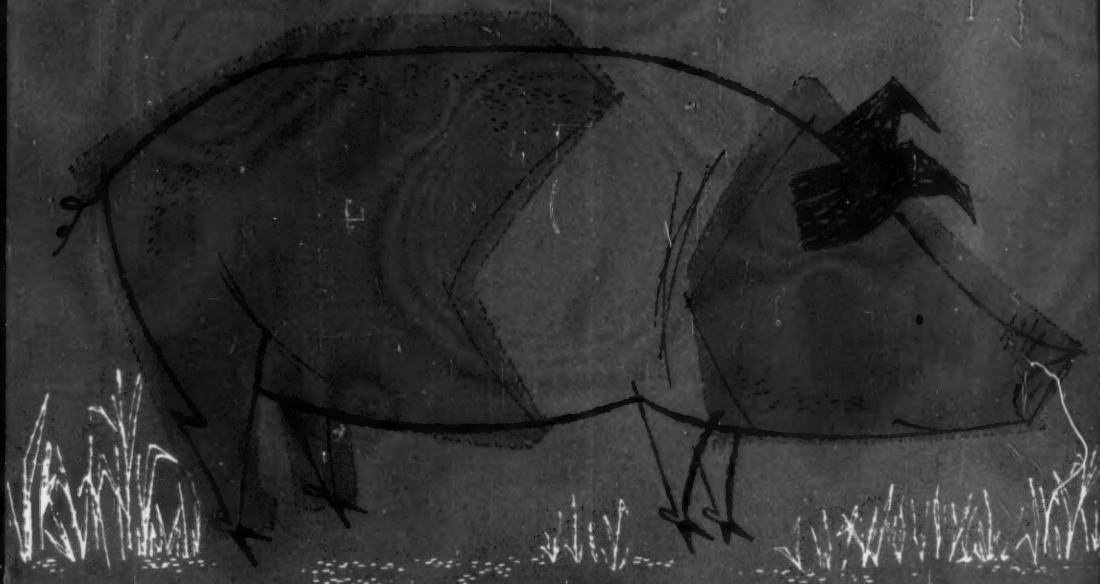
Abbott Laboratories		
Byogic	11	
Erythrocin Injectable	30, 31	
Affiliated Laboratories, Inc.	15	
Armour Pharmaceutical Co.		
Arlivite	34	
L-Povac	35	
Brinkman Manufacturing Co.		
Portable dog pens	4	
Carter-Luff Chemical Co.		
M.A.C.	42	
Clipper Service		
Sharpening service	51	
Colorado Serum Company		
Diagnostic services	43	
Colwell Publishing Co.		
Daily Log	41	
Corn Belt Laboratories		
Hydrodine	33	
Corn States Laboratories		
Tempacine	2nd cover	
Diamond Laboratories		
Feraject 110	8, 9	
Eaton Laboratories		
Furacin	17	
Furea	26	
Entelur	29	
Fort Dodge Laboratories		
Biotized Bacterin	24	
Frankville Specialty Co.		
Tamm udder supports	50	
Fromm Laboratories		
Distemperoid	19	
Heldenbrand and Son		
Cattle chute	50	
Hill Packing Co.		
k/d	7	
Hugus and Knuth		
Dog Walker	40	
Jensen-Salsbery Laboratories, Inc.		
Cytogen	4th cover	
Knoll Pharmaceutical Co.		
Sulfoctan	48	
Massengill, S. E. Co.		
Pet-tabs, Jr.	22	
Merck and Company		
Sulfabrom	36	
Nicholson Manufacturing Co.		
Veterinary supplies	18	
Norden Laboratories		
Iomycin	1	
Parke-Davis and Co.		
Benylin Expectorant	25	
Parlam Corporation		
Sebumol	5	
Pfizer Laboratories		
Cosa-Terramycin	12, 13	
Liquamycin Injectable	44, 45	
Pitman-Moore Company		
Bactrovet	3	
Swivax	3rd cover	
Plectron Corporation		
Electric ejaculator	53	
Professional Men's Indexing Service	46	
Schering Corporation		
Azium Boluses	28	
Squibb, E. R. and Sons		
Panalog, Vetalog	20, 21	
Stockwell Manufacturing Co.		
Veterinary tables	16	
Vanderbilt, R. T. Co.		
Vanguard 45	47	
Winthrop Laboratories		
Phisobex	6	



SAFETY

FIRST...

with lasting protection



Swivax*

The superior
hog-cholera vaccine
for **SOLID** immunity...

MODIFIED LIVE VIRUS • RABBIT ORIGIN • VACUUM DRIED

*REGISTERED TRADE MARK

(Licensed under U.S. Patent 2510978)

PITMAN-MOORE COMPANY



division of
ALLIED LABORATORIES, INC.



New
for
Distemper
Immunization

CYTOGEN®

(CANINE DISTEMPER VACCINE, MODIFIED LIVE VIRUS CANINE TISSUE CULTURE ORIGIN, LYOPHILIZED)

... the first modified live virus vaccine produced on canine tissue cells



To the recognized superiority of a modified live virus vaccine, Cytogen brings increased effectiveness where it counts most... the strength, quality and antigenicity of the virus itself. This means greater protection in more dogs.

Package: 10-1 dose vials,
with diluent

another new and exclusive product



research!

JENKEN-SALSBERRY LABORATORIES, INC.
KANSAS CITY 41, MISSOURI

